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CIRCULATORY DISTURBANCES OF THE EXTREMITIES: MEDICAL ASPECTS*

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I. General Considerations

THE maintenance of adequate circulation of the extremities, even under physiologic conditions, is not an easy task. It is natural, therefore, that severe disturbances of the circulation of the extremities develop with relatively slight derangement of the structure or of the function of the blood vessels. In the presence of inadequate cardiac output or low arterial pressure the blood supply to the fingers and toes, which are the most peripheral structures of the body, will become more impaired than that of other organs. In addition, the vessels of the extremities are less protected from external physical and chemical traumas. The extremities perform intense work; the lower extremities carrying the entire load of the uniquely upright body of the *homo sapiens*.

The majority of the circulatory disturbances of the extremities are but local manifestations of systemic diseases of the cardiovascular system. The central circulatory state plays a prominent rôle even if the vascular lesions are local.

In disturbed circulatory states the vascular responses frequently differ but quantitatively from normal physiologic responses. Thus there are but quantitative, and often ill-defined differences in the behavior of the blood vessels in physiologic senescence and in arteriosclerosis. Corresponding to one case with advanced disturbance there are many cases with milder manifestations. Raynaud's disease with attacks of extreme cyanosis or gangrene is rare, but milder manifestations of the same syndrome are common.

In managing patients it is important to appreciate that these frequent "forme fruste" manifestations of circulatory diseases of the extremities do not always advance continuously. Often the mild or even the severe cases improve spontaneously, and the symptoms may in time even disappear as a result of compensatory circulatory readjustments.

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II. Study of the Case

In the great majority of instances of peripheral vascular diseases a state of ischemia exists and the main purpose of the study of the case is to determine the character, extent, and degree. There are, contrariwise, conditions which are associated with hyperemia. The more important aspects to be evaluated in the study of the diseases of the peripheral circulation are the following:

Age of Patient: The older the patient, the greater the circulatory disturbance induced by the same type and degree of vascular damage. This is due mainly to differences in the efficiency of collateral circulation.

General Circulation: Patients with diseases of the heart and resulting poor peripheral circulation show more severe disturbances from the same degree of local vascular pathology. This is demonstrated strikingly by those rare cases of elderly persons with peripheral arteriosclerosis who, with the onset of tachycardia, rapid fibrillation and coronary occlusion, develop coldness and intense cyanosis of the hands and feet with ultimate gangrene.

Slow blood flow due to heart disease, arterial hypotension, or internal secretory disturbance predisposes to local vascular thrombosis. Arterial hypertension, on the other hand, acts beneficially in the presence of vascular occlusion.

High platelet count and viscosity of the blood are of significance in predisposing to thrombosis in the presence of local vascular damage.

Bodily States: Infectious diseases act unfavorably on certain local vascular conditions, especially on those associated with a tendency to thrombosis. On the other hand, they often induce peripheral vasodilatation, thus increasing the velocity of the blood flow and aiding collateral circulation. In ischemic disturbances, therefore, infection may aid through arteriolar dilatation.

The degree of tissue damage depends also on the physical activity of the patient. During the acute ischemic state rest prevents, and work

and exertion hasten, tissue damage. Later, however, graded exercise acts as a stimulus for the development of collateral circulation. Mental fatigue and conflicts have an important bearing on vasomotor spasms of the extremities.

Time Element: The duration of symptoms does not bear a simple relation to prognosis. On the whole, the slower the onset and progress, the better the prognosis.

Pain: Although an important and frequent symptom, pain cannot be regarded as a specific diagnostic aid, since it may be caused by diametrically opposite circulatory states. Thus, it is observed with regularity in the ischemic state of the circulation and likewise in hyperemic diseases, as is the case in erythromelalgia. Pain may also be due primarily to vascular diseases of the nutrient artery of the nerves, as is not infrequently the case in thrombo-angiitis obliterans. Burning sensations, hyperesthesia and other subjective disturbances may be equivalent manifestations to pain. The pain associated with ischemia is characteristically precipitated by exertion and relieved by rest (intermittent claudication). The pain related to hyperemia is worst with the extremities in the dependent position, and is relieved when they are in an elevated position.

The mechanism of pain in vascular diseases is not clear. In some cases the sensory nerve is directly involved; in others the ischemia induces muscular spasm and produces local metabolites which result in pain. Whether the vessels, particularly the arteries, are sources of pain sensation has not been established. Nerve endings, similar to those of sensory nerves, have been described in adventitia and media of arteries. It is claimed that spasm of the muscular coat of the artery, just as interstitial colic, induces pain.

Arterial Pulsations: Measurement of changes in the pulsatile expansion of arteries, as well as their palpation for consistency of their walls, is a classical procedure of examination. Comparison with the artery of the opposite side should always be made. Palpation of the dorsalis pedis artery is apt to present difficulties. Whereas in normal individuals it is usually, but not always, palpable, and is located lateral to the exterior longus hallucis tendon just between the proximal ends of the first and second metatarsals, in cases of edema, low blood pressure, and thickening of the vessels, its pulsation may not be felt. The pulsation of the posterior tibial artery, best felt behind and below the internal malleolus, is at times imperceptible in normal subjects. Similarly, the pulsations of the popliteal artery, located just outside the midline of the popliteal space, cannot be felt in obese individuals. The arterial pulsation may be measured quantitatively with the aid of the oscillometer. Differences between the two sides as well as the changes from time to time, rather than the absolute readings of this instrument, are of significance. Naturally neither palpation of the arteries nor the oscillometer gives an indication of the extent of the collateral circulation, and therefore neither method constitutes a measure of the existing circulation.

Arterial Blood Pressure: This can be measured in various parts of the extremities with either auscultatory or graphic methods. Sudden changes from one part to another, as well as absolute values, are of some significance.

Veins: The examination of the veins for fullness, emptying and filling in different positions yields valuable information. In ischemic states of the lower extremities the veins are apt to be collapsed, and after being emptied in the elevated position they fill up slowly in the dependent position.

Venous Pressure: This can be measured in the foot vein and in the femoral vein, after novocainization, without discomfort.

Color of the Skin: The color of the skin depends mainly on the oxygen content of the venous blood and on the state of the subpapillary venous plexuses. If the oxygen content of the venous blood is high as a result of rapid blood flow, the skin is bright red in color; if the blood flow is slow, it assumes an increasingly cyanotic appearance. As the venous plexus may dilate independently of the arterioles or at times may be in an active state of constriction even when the arterioles are dilated, no definite conclusion can be drawn from the degree of color as to the rate of blood flow. Nevertheless, the interrelation between skin color and position of the extremities is of great diagnostic significance in the estimation of the local circulation. Owing to a sensitive regulatory reflex interrelation between posture and vascular tone, the skin color changes relatively little in normal individuals when the extremities change from an elevated to a dependent position. At times there is some tendency to develop a cyanotic tint in the dependent position. In ischemic states of the circulation the color is deathly white in the elevated position and cyanotic in the dependent. With pronounced ischemia the change from white to intense cyanosis takes place slowly. In diseases associated with paresis of the blood vessels and increased blood flow there is a change from a normal or slightly increased bright color in the elevated position to an intense bright red color in the dependent position. This hydrostatic pallor or hyperemia should be studied in relation to its localization; to the angle of elevation that produces it; and to the time necessary for its development.

Temperature of the Skin: The temperature of the skin in controlled surroundings is one of the best quantitative indices of the local blood flow. With some experience the fingers can give satisfactory and valuable information, especially if the temperature of the opposite side is com-

pared. The thermocouple with the galvanometer gives accurate, absolute measures. Considerable normal variation exists, depending mainly on the vasomotor tone. In the presence of vascular pathology comparative figures for the two sides of the body are particularly significant.

Velocity of Blood Flow: The velocity of blood flow in the arterial and venous channels can be measured separately. The venous velocity in diseases associated with venous obstructions is of importance. Combined simultaneous measurements of the venous velocity and pressure may give especially valuable information on the state of venous circulation.

Blood Gas Studies: The oxygen and carbon dioxide difference between the arterial and the accompanying venous blood is directly related to the velocity of the local blood flow, and inversely related to the local metabolism of the tissues. Hence, the blood gas content may give accurate information on a number of disturbances of circulation and local metabolism. With the skilled use of local anesthetics, puncture of the femoral artery and vein can be performed painlessly and without harm. In numerous instances of emergency, especially in cases of collapse, we have introduced medication through the femoral vein with ease, when all other approachable venous channels were inaccessible. If a long needle of small calibre is introduced perpendicularly just along the median side of the femoral artery below Poupart's ligament, the vein can be entered with ease.

Volume of Blood Flow: Especially designed calorimeters may be employed to study the rate of blood flow through the extremities, if such information is essential. In vasospastic conditions, the volume flow is decreased; in vasoparetic conditions, it is increased.

Volume Changes in the Extremities: These can be measured with the aid of plethysmographs. The volume changes reflect changes in local blood or lymph volumes. If changes are sudden, they are, on the whole, expressions of changes in the volume of the vascular bed.

Visualization of Blood Vessels: In recent years intravenous or intra-arterial introduction of substances opaque to x-ray penetration, such as sodium and other iodide salts, has been used to visualize the arterial and venous trees of the extremities. This method, while sound in principle, has only limited applicability, however, as the technique, even after local anesthetic, is painful. Furthermore, in the presence of vascular obstruction, where its application is most needed, the substances may harm the already damaged tissues.

Estimation of Arterial Reserve and Collateral Circulation: In the presence of obliterating vascular diseases the determination of the reserve capacity of the arterial blood vessels to dilate, thus increasing local blood flow, is of great significance for two reasons: (*a*) it gives information as to the future development of effective collateral circulation; and (*b*) it furnishes a guide in the selection of therapeutic measures. These two problems of active arterial dilatation and collateral circulation are closely interrelated. The maximal active arterial dilatation can be determined by using methods which abolish the sympathetic innervation, or measures which activate the dilator muscles of the vessels directly. The sympathetic innervation may be abolished by inducing spinal anesthesia above the segments involved; by applying local anesthesia and alcohol to, or sectioning the sympathetic roots or ganglia; or, finally, by paralyzing or sectioning certain sensory nerves which carry vasomotor fibres. Chemical substances, such as bacterial toxins and acetylcholine, can produce dilatation partly through local nerve action, and partly through muscular action. The degree of increase in circulation, as obtained by these methods, gives a measure of the vascular reserve. If in the presence of cyanotic and painful feet due to arteriosclerosis, spinal anesthesia, for example, does not improve the color of the skin or its temperature, it is not rational to introduce measures which paralyze the vasomotor system permanently in the hope that they will be effective. Such result also indicates that the collateral circulation cannot be improved very effectively, and that radical surgical measures will have to be resorted to.

The establishment of effective *collateral circulation* is of the greatest importance in all obstructive disturbances of the peripheral circulation. The many unexpected variations in the clinical course of the individual case often depend on variations in the effective collateral circulation. Several aspects of the development of collateral circulation are still obscure, although they have been investigated extensively. The following factors, in various combinations, are involved in the development of collateral circulation: (*a*) *Anatomic characteristics and distribution of the arteries within and around the area involved.* The anastomosing branches vary in different vascular areas. The arteries of the foot and hand have numerous anastomoses. The popliteal artery, on the other hand, lacks anastomosis; hence, its ligation is frequently followed by gangrene. (*b*) *Pressure in the neighboring anastomosing arteries.* If the systemic pressure is high or becomes elevated after occlusion of the artery, collateral blood flow increases. (*c*) *Generalized arteriolar dilatation within and without the area involved.* Arteriolar dilatation increases the volume of blood flow and the capillary pressure; thus, it may aid the local ischemic flow within the area involved, and it may aid reversed blood flow from the surrounding area. Such dilatation of the blood vessels actually occurs as a result of depression of the sympathetic innervation caused by ischemia and by the accumulation of local vasodilator metabolites. (*d*) *A rapid and progressive dilatation of the anastomosing arteries.* Such marked dilatation and hypertrophy may develop

in the course of weeks. (*e*) *Growth of new vessels into the area involved.* The occurrence of this can be demonstrated histologically. (*f*) *The condition of the occluded artery below the obstruction.* There is usually a strong tendency to form collateral circulation around and below the occluded portion back to the main branch. In case of extension of the occlusion, this type of effective collateral circulation cannot develop.

It is obvious that morphologic, nervous, as well as chemical factors, in combination, play a rôle in the development of collateral circulation. The factors enumerated are particularly favored in youth and are interfered with in senescence.

III. Classification of Circulatory Disturbances of the Extremities

A classification of circulatory disturbances of the extremities, based on the presence of decreased and increased blood flow, is presented in Table I. This classification is obviously not entirely satisfactory, since in some instances the etiology and in other instances the presenting physiologic or morphologic vascular characteristics are used as a basis of division. Furthermore, in view of the fact that the same etiologic agents produce different types of vascular changes, repetition in different subgroups occurs. Another shortcoming of the classification is that it does not consider the fact that often the presenting syndrome of the patient is the result of a combination of various types of lesions. Thus arteriosclerosis and frost-bite, central circulatory disturbances and peripheral arteriosclerosis, Raynaud's disease and scleroderma, spasms due to tobacco and arteriosclerosis often occur together.

TABLE I

CIRCULATORY DISTURBANCES OF THE EXTREMITIES

I. With Ischemia

A.	*Cardiac Pathology; Narrowing of Aorta.*	
B.	*Vascular Spasm:*	
	1. Cerebrovascular Accidents.	
	2. Vasomotor Neurosis:	Raynaud's Disease—Early. Acrocyanosis. Acroasphyxia.
	3. Chemical Agents:	Ergot. Lead. Tobacco. Infections.
	4. Physical Agents:	Cold. Mechanical Trauma.
	5. Nerve Pathology:	Neuritis.
C.	*Structural Narrowing of Vessels:*	
	1. Arteriosclerosis.	
	2. Thrombo-angiitis Obliterans.	
	3. Raynaud's Disease—Late.	
	4. Arterial Emboli.	
	5. Arterial Thrombosis:	Infectious Diseases. (Arteritis.) Cardiac Pathology. Cold.
	6. Scleroderma.	
	7. Periarteritis Nodosa.	
	8. Thrombophlebitis:	Infectious. Familial. Polycythemic. Idiopathic.
	9. Varicose Veins.	

II. With Active Hyperemia

A. *Cerebrovascular Accidents.*
B. *Neuritis:* Nerve Injuries.
C. *Erythromelalgia.*
D. *Physical Agents:* Heat, etc.
E. *Arteriovenous Aneurysms.*

Summarized below are certain *pertinent clinical characteristics* of these circulatory disturbances:

Severe circulatory disturbances of the extremities can occur as a result of *insufficient cardiac action.* Such disturbances rarely lead to gangrene of the hands and feet. Rapid auricular fibrillation, paroxysmal ventricular tachycardia with poor myocardial function, and coronary thrombosis are the usual sources of such extreme manifestations. Slow circulation with decreased volume flow is the primary factor; but thrombosis, vascular spasms and arteriosclerosis play a secondary rôle. Often with the disappearance or slowing of the arrythmias considerable improvement, even in the apparently gangrenous tissues, may occur. The presence of cardiac pathology, the simultaneous appearance of cyanosis over the four extremities, the feeble or absent arterial pulsation over the distal ends of all extremities, and the absence of embolic manifestations in the other organs are of aid in differentiating this condition and embolic manifestations. In rare instances, congenital or acquired narrowing of the lumen of the aorta or of the opening of its main branches may also lead to circulatory disturbances.

Vascular thrombosis or hemorrhage of the central nervous system, acting as an irritative lesion on vasomotor centers, can produce a vasospastic state of the extremities with cyanosis and poor circulation. More often, however, owing to paralysis of the higher vasomotor centers, increased blood flow and edema of the upper extremities develop.

A certain type of *neurosis* or a persistent abnormal state of the *autonomic nervous system* is associated with the manifestations of vascular spasm. In the majority of these patients, such ailments, diagnosed as Raynaud's disease, acroparesthesia, and chronic acroasphyxia, start in youth, and after middle age there is a tendency toward improvement. Stigmas of abnormal psychic behavior, as well as signs of autonomic imbalance or of internal secretory disturbances (gigantism and acromegaly) are usually present. These vascular spasms are particularly prone to occur under emotional stress. Condi-

tioned psychic traumas also often play an important rôle. The manifestations are usually bilateral, but they may be unilateral, and the hands are more often involved than the feet.

As the vasomotor nerves run with sensory nerves, *neuritis* may in rare instances cause ischemia and arterial spasm; more often, however, it is responsible for hyperemia. Seldom are circulatory disturbances in diabetic patients related to neuritis. *Early arteriosclerosis* may cause spasm of the small arteries of fingers and toes. The presenting syndrome may be similar to that of Raynaud's disease.

Chemical agents are at times responsible for a spastic state of the arterial vessels. *Ergot* is a classical example. Ergot poisoning, due to spurred rye, has occurred in epidemics in Eastern Europe. In America it is a rare condition. I have seen two sad cases of poisoning, with gangrene of the feet, caused by continued therapeutic use of ergot postpartum. The general paleness and weakness of the patients, the constricted state of the arteries with no perceptible radial, tibial or dorsalis pedis pulsation made no other diagnosis rational. Following the discontinuance of ergot, relaxation of the arteries developed within twenty-four hours. (Unfortunately the secondary arterial thrombosis necessitated amputation of one foot in both cases.)

The rôle of *lead* and *tobacco* in the precipitation of arterial spasm is not well known. It is very suggestive that elderly persons with arteriosclerosis can develop severe intermittent claudication which improves after eliminating tobacco and exposure to lead. In the case of tobacco, improvement may occur within from thirty to sixty days after cessation of smoking. The high glucose content in the blood in diabetics leads also to intimal injury and arterial and venous thrombosis. The rôle of glucose, toxins in infections, and blood dyscrasias will be discussed later.

Of *physical agents* cold and surgical manipulations, or injury to the arteries, can cause vasospasm with blanching.

Circulatory disturbances resulting from *arteriosclerosis* are by far the most frequent. The mechanism of the development of arteriosclerosis is obscure. Certain types probably result from disturbed metabolism. In others intravascular pressure and chronic stagnation of the blood also play a very important rôle. The variation in the degree and the localization of arteriosclerosis is responsible for the manifold clinical manifestations. If the sclerosis involves the larger arteries only, nutritional disturbances may be completely absent even if the degree of sclerosis is marked. The accidental discovery of a dense arterial shadow in the x-ray picture of extremities with perfect circulation and function is not a rare occurrence. Contrariwise, if sclerosis is localized in the minute arteries and arterioles, severe disturbance may result even if clinical and x-ray examination of the larger blood vessels reveal no pathology. Weakness, "soreness," indefinite "neuritic" or "neuralgic" discomfort or pain over the extremities with sensation of coldness and vague numbness in elderly persons should suggest at once arteriosclerotic circulatory disturbances. Intermittent claudication on physical exertion, particularly in cold weather, is another frequent manifestation. Blanching of the foot on elevation with tendency to cyanosis in the dependent position, with veins which fill poorly and slowly, is often present. Depending on the severity of the condition, all the objective tests described above will indicate various degrees of ischemia, associated usually with thickened arteries, with decreased or absent pulsation. The pain, in contradistinction to thrombo-angiitis obliterans, is frequently not severe when the patient is at rest. At times it is present in the horizontal position of the body and absent when sitting. Warming of the feet and legs gives relief. Atrophy of the muscles and other evidences of defective local nutrition and trophic disturbances may occur. These nutritional disturbances may advance slowly when, due to secondary thrombosis, severe symptoms such as muscle cramps and pain attended by weakness, coldness and pallor, tenderness over the veins, and sudden advance of tissue damage leading to gangrene develop. Cyanotic patches and hemorrhagic areas now suggest impending gangrene. Thrombosis is particularly apt to develop where the changes in the intima are most marked, and the blood flow slowest. Hence, thrombosis of the dorsalis pedis and of the popliteal arteries occurs relatively frequently. Improvement may follow these alarming symptoms. Occasionally the improvement is only temporary as a result either of extension of the old, or of the development of a new thrombus. It is easy to understand how trauma or infection in such a circulatory state can cause sudden mortification of the tissues.

Diabetes and arteriosclerotic circulatory disturbances are closely related. The symptomatology of circulatory disturbances of diabetes is identical with that of arteriosclerosis. Diabetes apparently predisposes to and accelerates arteriosclerosis, although it is very suggestive that with the same degree of arteriosclerosis, circulatory disturbance and vascular thrombosis occur more frequently in diabetic patients. The increased viscosity of the blood glucose itself and metabolic disturbances may be responsible for the development of thrombosis and circulatory difficulties. This is suggested also by the improvement in the circulation following intelligent and successful treatment. As the vascular thrombosis in diabetic patients develops at a relatively earlier age, efficient collateral circulation, particularly in youthful patients, occurs with regularity. These are the patients who exhibit warm feet with no pulsation of the

larger arteries. The most essential difference between arteriosclerosis in the diabetic and in the non-diabetic patient is the susceptibility of the tissues of the diabetic patient to infections. Necrosis, ulcer, and moist gangrene are more often present in diabetic patients. The extremities of the diabetic, in general, are also more sensitive to mechanical and thermal traumas. The tragic effect of a scratch, cut, or burn in diabetics should always be remembered. Sudden pain in the leg, with intermittent claudication, paleness, and localized cramps are indicative of vascular thrombosis in a diabetic patient, and the careful supervision and management of such a patient is of great importance.

Thrombo-angiitis obliterans represents a striking vascular clinicopathologic entity of unknown etiology. Its symptomatology and clinical course show numerous variations. Its chief pathologic characteristic is an inflammatory involvement of arteries and veins with a tendency to early and frequent vascular thrombosis. It occurs in youthful males with predilection for the Jewish and Chinese races. The usual early symptoms are intermittent claudication and indefinite pain over sole of the foot, ankle, or toes in walking. These symptoms may exist for weeks or months without obvious signs. Sooner or later, however, a rather intense red or slightly cyanotic color of the toes and feet appears in a dependent position. This "erythromelia" is associated with much discomfort. Later the arterial pulsation disappears, and blanching and trophic disturbances, particularly around the nails, may follow. Fissures between the toes and over the sole may also develop. The toes and the forepart of the foot swell slightly and acquire "an artificial appearance as if molded in wax". Following a mild trauma, hemorrhagic blebs with cyanosis and intense pain occur. Healing may be slow, or rapidly progressing signs of gangrene may even develop. The later course will vary, depending on the type and the number of vessels involved, on the organization and recanalization of the thrombi, and on the degree of collateral circulation. In instances where the perivascular inflammation or thrombosis of the nutrient artery involves the nerves, the pain may be unbearable and constant. If the superficial veins are predominantly involved, the course may simulate that of a migrating phlebitis. If the clinical picture is insidious and slow, trophic disturbances may not be present even after years. On the other hand, the gangrene in acute thrombosis may be so sudden that embolus is often suspected. Although extensive vascular occlusion may develop in both extremities, symptoms may be only unilateral, or the clinical course may be acute in one extremity and chronic in the other. Rarely all four extremities may become diseased. In addition to the extremities, other arteries, such as the coronary, renal, and splenic may become involved in rare instances. The disease may become arrested or may even heal spontaneously.

The early recognition of *arterial embolism* is of great practical significance, because if embolectomy is performed within ten hours after the onset, the chances for recovery are good. It occurs usually in the presence of cardiac disease, particularly of rheumatic origin and with fibrillation of the auricles. Occasionally its source may be the pulmonary vein, the aorta, or the right chambers of the heart if the foramen ovale is present. If such a patient with heart disease complains of sudden pain in the extremities, followed by sensation of coldness, cramps, numbness, tingling and weakness, and if examination reveals rather sharply demarcated blanching with later cyanosis, loss of muscular power, and cold skin, the presence of embolus should be suspected. The loss of pulsation below, and the presence of pulsation above the embolus confirm the diagnosis. At times the embolus is felt as a nodule within the artery, and often the arterial pulsation is intensified above this spot. The embolus usually lodges at the bifurcations of vessels, and tendency to secondary thrombosis formation may occur several hours later. At the onset of embolus, pain may be only slight or even absent. At times the embolus may be bilateral and symmetrical over the lower extremities.

Arterial thrombosis develops, not only in the conditions mentioned above, but also in infectious diseases associated with arteritis. *Syphilitic* arteritis causes but rarely arterial thrombosis of the extremities. A precocious form may develop during the secondary stage. Occasionally thrombosis occurs in idiopathic inflammation of the intima. The clinical course shows the same variation as in arteriosclerosis. Thrombosis occurs also frequently in association with exudative and necrotic lesions of the media and intima of *periarteritis nodosa*, a condition of great rarity.

Thrombophlebitis is considered an independent syndrome, although it is only a manifestation of a number of etiologic agents. Systemic and local infections, trauma of the veins, lesions of the intima, slow blood flow, high platelet content and high viscosity of the blood are recognized as playing an important rôle. Thrombophlebitis exists frequently without the presence of bacterial infections. Often inflammatory diseases of the lymph vessels and the veins are closely related to each other. Dr. John Homans believes that lymphangitis may precede the phlebitis and thrombosis. In the very early stage the skin is apt to be somewhat flushed and slightly cyanotic, and red streaks are visible along the lymphatics. Swelling may be present but evidence of venous obstruction may not exist. Tenderness along the veins with palpable thrombus develops later. In phlegmasia alba dolens the

lymphangitis must play a predominant rôle in causing moderate edema, pain and discomfort. In addition to extensive lymphadenitis, at times, nerves, arteries and veins are involved together. Fever may last for weeks, and complete functional recovery may be slow. The rare cases of migrating phlebitis at times with familial tendency are not understood at present.

Scleroderma and dermatomyositis may be associated with considerable circulatory disorder especially in the later stages, but in these conditions vascular changes are secondary.

Circulatory disorders associated with increased blood flow are not common. *Erythromelalgia* is the classical example. This very rare condition is often diagnosed erroneously. It is probably a neurosis with attacks of apparent paralysis of vasomotor innervation. It may last for decades and the disturbance may become continuous. There is bilateral burning of the hands and feet, particularly during standing. The extremities involved exhibit heat with bright red color. There is increased pulsation which may even involve the veins. Hyperesthesia and hyperhidrosis may be present.

Arteriovenous fistulas or aneurysms are also associated with increased blood flow. The recognition of this condition with the usual history of trauma and with the presence of dilated and pulsating veins often with thrill and bruit at and around the communication is easy. The dyspnea on exertion with increased heart rate, which slows upon compression of the aneurysm, the low diastolic pressure, the cardiac dilatation and evidence of recognized arteriolar dilatation are confirmatory signs.

PATHOLOGICAL ASPECTS

Dr. Tracy B. Mallory* was the second speaker on the program. Dr. Mallory discussed the pathologic histology in the blood vessels in arteriosclerosis and in thrombo-angiitis obliterans, illustrating his talk with lantern slides of microscopic pictures of the disease. The structure of the normal artery was first depicted and briefly reviewed.

In arteriosclerosis four important changes are noticed in the tissues of the vessel walls: One of these is a reduplication of the internal elastic lamina; the second, a fibrous thickening of the intima; the third, deposits within the intima of lipoid substances, and the fourth, degeneration of the muscle cells in the media shown first by fat and later by calcium deposits. There is no consistent relationship between the extent of these various processes. It is usually assumed that all of them except the lipoid deposit in the intima are irreversible processes. Aschoff has shown that the lipoid deposit, in contrast, is definitely reversible, at least in youth. He showed that atheromatous deposits were frequently found in infants under one year of age. Then they tend to disappear but again are found with considerable regularity at about the time of puberty. A second disappearance is the rule until the middle twenties when they reappear again and in all probability remain persistent or increase steadily in degree. By this time fibrous intimal thickening has occurred and it is possible that this thickened intima is the cause of the irreversibility from this time on.

Appearing first, at about thirty, and rarely or never seen in childhood except in diabetes, is another type of change which correlates only slightly with atheroma. This consists in degeneration of the muscle cells of the media, evidenced first by a deposition of fine fat droplets. Later granules of calcium appear which may eventually fuse into large homogeneous calcium masses and may even be transformed into true bone with well-formed trabeculae and intervening marrow spaces. We have no knowledge of the factors concerned in these pathologic sequences, but it seems probable that there must be local as well as general factors since in no other way can the extraordinary variation in extent of the disease in individual arteries be explained.

In thrombo-angiitis obliterans a totally different picture is observed. The three most important changes are thrombosis with an unusual tendency to highly vascular organization, inflammatory changes in the walls of the blood vessels, and similar changes in the surrounding tissue. In the acute stages of the disease seen most frequently in superficial veins removed by biopsy, inflammatory exudation is invariable. The most characteristic feature is the appearance of miliary abscesses consisting of closely packed polymorphonuclears and of miliary giant cell foci which sometimes suggest miliary tubercles and gummata. The specificity of these lesions has been questioned but it is at least fair to say that they are seldom seen in other conditions. Buerger has found such lesions in arteries as well as veins, but most workers have failed to find arterial lesions. Several lantern slides from a case of Buerger's disease involving a coronary artery were shown in which typical acute lesions were present. The vessel walls in all cases of thrombo-angiitis are remarkably free from evidences of necrosis, so that reaction to the products of degenerate cells cannot be assumed in explaining the leukocytic infiltration. The entire picture fits best with the concept of a specific infectious disease of the blood vessels.

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SURGICAL ASPECTS

DR. ARTHUR W. ALLEN* spoke on some of the surgical aspects of peripheral vascular disease, and discussed the practical details of case management. His report was based on a study of 120 cases of arteriosclerosis, 96 cases of thromboangiitis obliterans, and 94 diabetics with peripheral vascular lesions, treated in the Massachusetts General Hospital in the past four years.

The following table of differential diagnosis was shown by lantern slide, representing the present conception of the Peripheral Vascular Clinic regarding these lesions:

	Vasomotor Disturbances	Obliterative Arterial Diseases		
	Primary Vasomotor Imbalance Raynaud's Disease	Thrombo-angiitis Obliterans Buerger's Disease	Arteriosclerosis Mönckeberg's Type	Arteriosclerosis Senile Type
Average Age	30	40	50	60
Sex	Female 70%	Male	Male 60%	Both
Nationality	All	Hebrew 40%	All	All
Duration of Symptoms	Years	Years	Months	Months
Extremity First Involved	Upper	Lower	Lower	Lower
Symmetry	Bilateral and symmetrical	One side at a time	One side at a time	One side at a time
Gangrene Develops	Late	Late	Early	Early
Local Palpation of Vessels	Normal	No pulsation	Faint or absent	Faint or absent
X-ray of Vessels	Normal	Normal	May show some calcification	Show marked calcification
Vasomotor Index	Marked	Mild	Slight	Slight
Development of Collateral Circulation	None	Good	Slight	Fair
Outcome with Treatment	Excellent	Good	Poor	Fair

He emphasized the existence of Mönckeberg's arteriosclerosis as a clinical entity and pointed out that the prognosis in this type of obliterative disease is worse than in any other. The successful treatment of the whole allied group of arterial obliterative diseases depends on the establishment of collateral circulation, and pointed out that sometimes in Buerger's disease the collateral vessels, in turn, may become involved. It is important in both arteriosclerosis and Buerger's disease that a proper régime of postural exercises, rest, and general hygiene be instituted.

Tables listing the important points in the routine study and treatment of arterial obliterative disease were shown. (*New Eng. J. Med.* 204: 859-862 [April 23] 1931.) Such routine measures are really of more importance than specific methods of treatment. Recent work of Maccock and Coller (*Proc. Soc. Exper. Biol. & Med.* 29: 487 [Jan.] 1932) seems to have definitely proved the disputed point that tobacco causes peripheral vasoconstriction; hence smoking must be curtailed or prohibited. A list of directions given ambulatory patients for the proper care of the feet was illustrated. Dr. Allen warned against the use of tissue-injuring antiseptics and suggested that S.T. 37 in open lesions and 70% alcohol as a prophylactic are probably the safest antiseptics for these people to use.

In conclusion Dr. Allen turned to the subject of specific remedies. There are none for arteriosclerotic obliterative disease, but many have been advocated for thrombo-angiitis obliterans and among the latter are (1) saline and citrate solution intravenously on the theory that such treatment decreased blood viscosity; (2) constrictive hyperemia (as advocated by Cushing in Raynaud's disease); (3) Bier's hyperemia; (4) non-specific foreign protein; (5) *Surgical Measures*, (a) arteriovenous anastomosis (now discarded, although Bernheim of Baltimore seems to have one case that was benefited by this procedure), (b) high vein ligation, which does very little good in most cases, (c) ligation of the main artery in order to force all blood through the collateral circulation (advocated by Dean Lewis), (d) periarterial sympathectomy, originally advocated by Leriche for relief of "trophoneurosis". Even though this procedure was not intended for Buerger's disease, it has been extensively used but with very poor results, (e) peripheral nerve block (our best procedure so far), (f) ganglionectomy, which few cases of obliterative disease warrant, due to their low vasomotor index.

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A SCARLET FEVER OUTBREAK DUE TO RAW MILK

BY ROY F. FEEMSTER, M.D.,* AND J. M. KINGSTON, V.M.D.*

As long as we have milk supplies unprotected by pasteurization, we shall continue to have outbreaks of disease carried by milk. Fortunately over 85 per cent of the milk of Massachusetts is pasteurized and outbreaks are limited to fewer and fewer cases since no large supplies are now unprotected. During the last five years there have been 16 known outbreaks of milk-borne disease in Massachusetts, and in not a single instance has a milk supply of over 300 quarts been involved. This report deals with another epidemic on a small raw milk route.

ESTABLISHING THE PRESENCE OF AN EPIDEMIC

It took very little investigation to establish the fact that there was a milk-borne outbreak at the time our attention was called to the situation. Between February 1 and April 15, 1933, a period of ten weeks, there had been only 13 reported cases of scarlet fever in East Bridgewater (population 3,591). At the beginning of the investigation on April 24, 21 cases had already been reported since April 15. Forty-one cases eventually occurred in the two weeks April 15 to April 30 (See Table I). The distribution of the cases among the milk dealers clearly pointed to the one milk supply (Dealer E) already under suspicion, as shown in Table II. Furthermore, the cases were scattered all over the town and there was no possibility that they could have been contact cases for some lived three or four miles apart, and there had been no social function or other meeting which all had attended, and the milk supply was the only factor in common.

TABLE I

SCARLET FEVER CASES REPORTED BY EAST BRIDGEWATER AND WEST BRIDGEWATER FEBRUARY 1-MAY 13

Week Ending	Number of Cases Reported	
	East Bridgewater	West Bridgewater
Feb. 4	1	0
" 11	0	0
" 18	0	0
" 25	0	0
Mar. 4	1	0
" 11	0	0
" 18	2	0
" 25	1	0
Apr. 1	2	0
" 8	3	0
" 15	4	0
" 22	23	9
" 29	14	12
May 6	2	0
" 13	3	0

TABLE II

DISTRIBUTION OF CASES AMONG MILK DEALERS OF EAST BRIDGEWATER

Dealer	Quarts delivered daily	Cases of Scarlet Fever April 15 April 30	
		Number	Rate per 100 quarts
A	300	2	0.6
B	200	0	0
C	150	0	0
D	100	0	0
E	75	35	47.
F	50	0	0
G	30	0	0
H	20	1	5.
Private supply	—	2	—

In West Bridgewater (population 3,206) the earliest cases reported were in the families of the two regular customers of two stores supplied by Dealer E and the later cases among families who bought only occasional quarts at the same stores. Here again the cases could not be accounted for by contact, as the families were scattered. No cases of scarlet fever were reported in the period February 1 to April 15 (See Table I). Twenty-one cases occurred between April 15 and April 30, all of them except one being in families who used milk from the East Bridgewater dealer.

Another fact which pointed to a milk-borne outbreak was that several members of a family became ill practically simultaneously, those who did not show clinical scarlet fever having severe sore throats resembling the clinical picture of septic sore throat. One incident further supported the suspicion of the milk supply. Three children from Boston visited their grandparents in East Bridgewater and drank the milk for two days. The next day after returning home, two of them were ill with scarlet fever and were sent to the Boston City Hospital contagious disease ward.

Another interesting epidemiological fact was that in each of four families where cases of scarlet fever occurred an infant was being given either pasteurized or boiled milk and consequently escaped the initial infection. In two of the families the infant later developed a secondary case of scarlet fever from contact with earlier cases in the home.

The chronological occurrence of the cases is shown in Table III. The fact that the cases continued to be reported almost daily over a period of two weeks would seem to indicate that

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the milk carried the causative organism practically continuously for a considerable length of time. Such a condition points strongly to an infected udder in the dairy herd for it is difficult to believe that a carrier or a case could keep the milk so consistently and so heavily contaminated. There is a bunching of the cases somewhat into three groups around the dates of April 18, 20 and 24, which suggests that the milk may have been more heavily contaminated two or three days before each of these dates. This concentration at particular dates was not limited to cases of primary scarlet fever. The cases of sore throat among other members of the family displayed the same characteristic grouping (Table III). Some of the 7 cases classed as secondary may have been primary, due to drinking the milk at a later time, but when more than three days elapsed between the first and succeeding case in a family, the latter was classed as secondary.

TABLE III

CHRONOLOGICAL OCCURRENCE OF INFECTIONS AMONG USERS OF THE SUSPECTED MILK SUPPLY

	Scarlet Fever		Sore Throat	Total
	Primary Cases	Secondary Cases		
April 15	3	—	1	4
" 16	4	—	—	4
" 17	5	—	6	11
" 18	4	—	11	15
" 19	1	—	5	6
" 20	7	—	3	10
" 21	4	—	—	4
" 22	4	—	2	6
" 23	2	1	1	4
" 24	8	1	7	16
" 25	5	1	1	7
" 26	1	1	—	2
" 27	1	—	1	2
" 28	1	1	—	2
" 29	—	1	—	1
" 30	—	1	—	1
Totals	50	7	38	95

THE SOURCE OF THE INFECTING ORGANISMS

It was impossible to determine the exact source of the epidemic. The milk dealer would not admit that there had been any suspicious illness in his family during the weeks preceding the outbreak and nothing could be found on physical examination to lead to such a suspicion. Throat cultures of the family disclosed that five of the ten were carrying hemolytic streptococci but they may have picked them up from the milk, which they used in considerable quantity themselves, as eight days had already elapsed since the first case occurred. It happened that the two who handled the milk did not have streptococci in their throats.

As mentioned above, the distribution of the cases pointed to an infected udder. The herd was examined on the first day of the investigation and two cows were found to have mastitis, one of recent origin and one of long standing with atrophy. In each instance the infection was limited to a single quarter. Milk obtained from the cow with the more acute infection did not show hemolytic streptococci but showed numerous other bacteria. No milk was obtainable from the atrophied quarter of the other cow, only a small quantity of inflammatory exudate being forced out through a milk tube. This material showed hemolytic streptococci. Milk from the other three quarters of the two cows as well as from all the other cows in the herd did not show hemolytic streptococci. The dealer was using the milk from the three good quarters of the two cows but assured us that none from the affected quarters had been used. The herd was reëxamined five weeks after the outbreak. The cows were found in good condition and no other udder infections had occurred in the meanwhile. Samples of milk were obtained from all the cows and found to be free from hemolytic streptococci.

Since no suspicious illness had apparently occurred on the milk farm, sources from which the organisms might have been imported were looked for. It was found that there had been an illness in the home of one of the dealer's customers that was quite likely scarlet fever. The onset was April 6. There was also a definite case on his milk route with an onset on April 11. Whether the streptococci might have been imported into the dairy from one of these cases will never be known and is probably less likely than that it came from the throat of one of the milkers.

THE INCUBATION PERIOD

Because some of the families bought most of their milk from other sources and only an occasional quart from the infected supply, the incubation period can be fairly accurately estimated in a few instances, where the infection was definitely due to a particular quart of milk. Table IV shows the date on which the milk was used and the dates of onset of the cases of scarlet fever or sore throat in six families. In two instances a small child was ill by the end of 24 hours. Forty-eight hours was the most frequent time elapsing between using the milk and the appearance of the first symptoms; in 11 of the 15 cases the period was this length or less. In one instance the exact number of hours could be determined. The milk was used late Sunday night (April 23) and before Tuesday noon all three of the family were ill and two were in bed. The father had a severe sore throat with recrudescences over a period of ten days, the child had a definite case of scarlet fever;

the mother suffered only a moderately severe sore throat.

TABLE IV

ESTIMATION OF INCUBATION PERIOD

Date on which milk was used	Dates of Onset	Remarks
April 17	April 18, 19	Infant ill first, sore throats.
" 19	" 21, 21	Both scarlet fever.
" 20	" 22	Scarlet fever.
" 22	" 24, 25	Both scarlet fever.
" 23	" 25, 25, 25	1 scarlet, 2 sore throat.
" 23	" 24, 25, 26, 27	Youngest child first, all scarlet fever.

THE CLINICAL PICTURE

The illness caused by drinking the milk varied all the way from easily diagnosed scarlet fever, with a characteristic rash, throat, tongue, fever and prostration, desquamation, and subsequent otitis or adenitis, through the various milder forms, in which some of the usual features were missing, to the other extreme where there was only a sore throat of varying degree, and in one or two instances even the sore throat was so mild that it might have been overlooked had not the cervical glands become enlarged and painful.

In a few cases the sore throat was very severe. There was marked prostration, high fever, edema of the larynx sufficient to interfere markedly with breathing, and in two cases a pharyngeal abscess developed.

One case, a man of 26, developed bronchopneumonia and streptococcic septicemia and died within a day or two after admission to a contagious disease hospital. This was the only fatality.

THE INCIDENCE OF CASES AMONG USERS OF MILK

A visit was made into practically every household where the milk was delivered regularly and information obtained as to illnesses which had occurred since the beginning of the outbreak. In these households there were 167 individuals. Of these 19 claimed not to have used the milk raw, leaving 148 who did use the raw milk. Fifty-seven cases of scarlet fever and thirty-eight cases of sore throat occurred among these individuals, which gives a total of 95 infections of some kind. In other words, 64 per cent of those who were known to have used the milk became ill (See Table V). Every individual who had used the milk could not be reached because there were some who had bought only an occasional quart at the stores and the proprietors had kept no record of those who had purchased some of the infected supply.

Further study of the table brings out some other interesting points. As would have been expected, the highest attack rate for scarlet fever was in the lower age groups and the rate became progressively lower with increase in age. The concomitant sore throat in other members of the families did not show any such relationship to age, but there was a tendency for the highest rates to occur in the older age groups. The highest rate was among those over 25 and the lowest among those 5 to 9.

It is also noteworthy that 95% of the children under 5 years who used the milk became ill and that the attack rate for total infections progressively decreased with age.

There were 13 individuals among the 148 who used the milk who gave a definite history of having had scarlet fever. However, it was not felt that the history of previous scarlet fever was known or remembered accurately enough to make it justifiable to modify the tables with these 13 cases when undoubtedly a number of others in the 148 must likewise have had scarlet fever in the past. If Table V could have shown the attack rate among the actual susceptibles, as determined by the Dick test or other accurate measure of immunity, the rates would have been even higher.

CONTROL MEASURE INSTITUTED

The milk dealer was immediately ordered by the local boards of health concerned not to de-

TABLE V

ATTACK RATE AMONG USERS OF INFECTED MILK.
EAST AND WEST BRIDGEWATER

Ages	No. of persons in households	No. who used milk	Number of Cases: Scarlet Fever	Sore Throat	Total Infections	Attack Rates: Scarlet Fever	Sore Throat	Total Infections
0-4	24	20	15	4	19	75.0	20.0	95.0
5-9	14	14	9	2	11	64.2	14.3	78.6
10-14	19	19	10	5	15	52.6	26.3	79.1
15-19	15	15	5	5	10	33.3	33.3	66.7
20-24	16	16	6	3	9	37.5	18.7	56.2
25 and over	79	64	12	19	31	18.8	29.7	48.4
Total	167	148	57	38	95	38.5	25.6	64.2

liver any more milk which (1) included milk from the cows under suspicion, and which (2) was not pasteurized. Because the epidemic had disrupted his retail trade, he decided to give up his route and dispose of his milk to a dealer in a nearby city who sold only pasteurized milk. Likewise he was convinced that it would be economically expedient to butcher the two cows under suspicion. After slaughter, hemolytic streptococci were recovered from the udder of the one cow whose milk had earlier contained the organisms.

SUMMARY

An outbreak of 57 cases of scarlet fever and 38 cases of sore throat occurred on a milk route of only about 75 quarts delivered daily.

The consistent and heavy infection of the milk, as evidenced by the chronological occurrence of the cases, points strongly to udder infection in the herd. Hemolytic streptococci were found in the udder of one cow.

Ninety-five per cent of the children under 5 and sixty-four per cent of persons of all ages who used the milk had either scarlet fever or sore throat.

In 11 cases out of 15 in which it could be estimated, the incubation period was 48 hours or less.

Four infants who were being given pasteurized or boiled milk did not become ill when the initial cases occurred in the family. Two developed contact cases of scarlet fever later.

The occurrence of secondary cases due to contact in the families affected emphasizes that the total effect of such an outbreak is not over with the first generation of cases.

Again we have an outbreak of milk-borne disease spread by raw milk through a small route. With about 85 per cent of our milk pasteurized, it is the small raw routes that are the potential menace.

NATIONAL CAMPAIGN TO SAVE SIGHT CONGRATULATED ON TWENTY-FIFTH ANNIVERSARY

The twenty-fifth anniversary of the organized movement for conservation of vision in America was observed in New York City, May 24, in the offices of the National Society for the Prevention of Blindness which held open house. Messages of congratulations on the Society's accomplishments and extending good wishes for the future, received from notables in many walks of life, were read by Lewis H. Carris, managing director.

A cable from Prof. F. de Lapersonne, president of the International Association for Prevention of Blindness, which maintains a secretariat in Paris, addressed "heartiest congratulations to the American National Society and warmest wishes for a larger development of its noble philanthropic work". The message also expressed "gratitude for the American Society's considerable share in founding the International Association four years ago and for the valuable help and advice which it has constantly given".

The Society's "leadership and inspiration among the agencies in health and social work" were especially commended by Dr. William F. Snow, president of the National Health Council, in a letter to William Fellowes Morgan, president of the National Society for the Prevention of Blindness. Dr. Snow said:

"You will receive letters on this twenty-fifth anniversary from each of the member agencies of the National Health Council. But, as president, I want to add a special note of felicitation and appreciation of the Society's statesmanship and understanding teamwork in promoting conservation of vision as a part of rather than separate from health conservation as a whole. Never has the Society forgotten the mind and body behind the eye. This is significant in the history of special interest agencies."

Edward L. Keyes, president of the American Social Hygiene Association, wrote as follows:

"Naturally your great achievement in reducing the prevalence of ophthalmia neonatorum interests us particularly; and your plans for further extension of activities against syphilitic keratitis commands our special commendation and offer of coöperation. Our admiration for the great work you have accomplished is not limited to such special phases of your program. Our directors realize that these are but a part of your whole balanced program, which promises even greater results in the coming years."

Commending the Society's campaign against the eye hazards of industry, William H. Cameron, managing director of the National Safety Council, wrote:

"The National Society for the Prevention of Blindness has a record of achievement which deserves recognition by every individual and institution interested in human welfare. The National Safety Council has long been happy to coöperate in your constructive national effort to preserve that precious asset of eyesight which is so vital to the normal functioning of life. This coöperation has been particularly active in American industry and measurable results have been obtained that should furnish inspiration for a continued and expanded program."

Miss Marguerite A. Wales, General Director of Nurses of the Henry Street Visiting Nurse Service of New York, sent the following greeting:

"The Visiting Nurse Service of New York City is pleased to send its warmest congratulations to another organization in the field of public health, the National Society for the Prevention of Blindness, which may be justly proud of its accomplishment in saving sight since its small beginning twenty-five years ago. All of us who know of the Society's development from a campaign against blindness among infants in New York State to a nationwide attack on all preventable causes of blindness, have the highest admiration for its work."

MASSACHUSETTS MEDICO-LEGAL SOCIETY

INDUSTRIAL POISONS*

BY ALICE HAMILTON, M.D.†

WHEN I was asked to speak to an audience interested especially in medical-legal problems it seemed to me that it would be better to confine myself to that aspect of industrial poisoning and, since it is impossible to cover more than a small field, to select the most important of the poisons, lead, and then to take up those newer compounds which have become so very important of late, the volatile solvents.

We are all familiar with lead poisoning in its usual manifestations, but there are unusual forms difficult for the physician to be perfectly sure of even in his own mind, and very difficult to present convincingly to a board of laymen who deal with claims for compensation. A typical case of lead poisoning in a man working at a known lead trade is simple, and here in Massachusetts we are very fortunate in having a method of handling such cases which is rather unique and far superior to that which obtains in most states. Massachusetts is in a class with four other states, Connecticut, Wisconsin, California, and one of the smaller western states, which are the only ones that endeavor to cover all forms of occupational disease without depending on a narrowly specified list, usually obsolete before it is adopted. There are only eleven states out of the 48 that compensate for industrial diseases of any kind, and the other six all have schedules of selected diseases, always faulty and never up-to-date.

In dealing with a case of lead poisoning before an industrial board there are three things that have to be established, namely, exposure to lead, absorption of lead, and damage from the lead, or lead intoxication. Exposure is established by the history of the man's occupation, and it is important to show how long he has been exposed to lead. If the exposure has been slight but prolonged over a long period of time, you would not expect a sudden development of severe lead poisoning or of palsy, or an attack of encephalopathy; you would expect a slower form of poisoning, essentially chronic in character, with perhaps an occasional acute exacerbation. For instance, I was called in on a case of supposed severe lead poisoning with permanent and complete disability. It was in a woman who had motor paralysis of both legs but not a typical ankle drop. She was emaciated and had a red blood count below 2,000,000, with many abnormal forms of red cells. She had been employed for two years only in an unusually clean printing plant and in the composing room, where there was no source of lead fumes and a minimum of dust. It would be impossible for so severe a form of lead paralysis and anemia to develop in two years' time from an exposure so slight. This was a case of pernicious anemia. On the other hand, I saw before the War a man with extensor paralysis of both wrists and both ankles, with extreme cachexia, mental dullness, and a blood count of 2,300,000. This man was profoundly leaded. He had been exposed for seven years to very fine lead dust from grinding colors, and he suffered from a form of lead poisoning which is almost never seen nowadays, for there is rarely such an excessive exposure over so long a period as that.

Exposure, then, is shown by the history of a man's occupation and the severity is shown by the character of the work, the length of time that he has been engaged in it, and the conditions in that particular plant. Then having proved exposure, it must be shown that absorption of lead is taking place. If you can find the lead line on the gums, your worries are at an end. That is the easiest and most convincing proof of lead absorption, but we see it less and less often all the time. American workmen, nowadays, are usually cleanly in their habits and the use of the toothbrush is general. Even dentistry is looked upon as a necessity rather than a luxury. It is really hard to find a good lead line nowadays, and I never did find it in the majority of the better paid lead workers, such as painters, potters, and least of all, printers. In 1914 a physical examination was made for the Bureau of Labor Statistics of 100 Boston printers and 100 Chicago printers, nine per cent of whom were shown to have chronic plumbism, but there were only two lead lines in these 200 men. The line is therefore a great help if it is present, but its absence means nothing.

The detection of lead in the urine is proof of absorption of course and we used to regard this test as extremely valuable, but we have had to change our opinion of it since the discovery that individuals not exposed to any known source of lead may excrete lead in both urine and stools. Leake, who conducted the study for the Surgeon-General's report on the danger of lead poisoning from the use of tetra-

*Read at the meeting of the Massachusetts Medico-Legal Society, February 1, 1933.

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ethyl lead gasolene, found that the non-lead workers in his control group excreted lead from time to time; and Aub and Kehoe have had the same experience. It is true that a large quantity of lead in the excreta is significant. Aub says it is better to test the feces than the urine, because excretion of lead through the latter is intermittent and undependable. However, the presence of lead in the stools only is not really proof of absorption, for the lead may have been ingested and excreted without ever reaching the general circulation.

The examination of the blood for stippled red cells is the proof of absorption on which most dependence is placed, and its use is so general that even the working man knows about stippled cells. Strictly speaking, the stippled red cell proves not only absorption of lead but lead intoxication, for this cell is a young red cell, immature, thrown out into the circulation because of the anemia produced by the destructive action of lead on the erythrocytes, and it has suffered damage from the lead circulating in the plasma. This means that the presence of stippled cells shows that lead poisoning has already begun although it may be in a very early stage. But it is not only in lead poisoning that these cells are found. They are present in the blood of various forms of secondary anemia and in chronic anilin poisoning. A great deal of work has been done on the question of the diagnostic significance of stippled red cells, some authorities holding that they must be present in a certain definite proportion, others holding that the proportion should be lower or higher. The safest guide is the whole blood picture. In other forms of anemia the presence of stippled cells is accompanied by a fairly marked anemia, a low red cell count and low hemoglobin, but it is characteristic of lead poisoning that the number of stippled cells is quite out of proportion to the anemia. In lead poisoning you do not expect to have a count much under 4,000,000, nor a hemoglobin much under 75 per cent; but with this fairly normal blood picture you may have a large number of stippled cells.

Suppose you have proved exposure and absorption. That is not enough for an industrial compensation board, you must prove that the man is ill and that he is suffering from lead poisoning. He may not present a clear-cut picture at all and your diagnosis may have to be based on a combination of objective signs and symptoms, no one of which is conclusive alone but together they make up a convincing picture. It is impossible to go into detail on this subject, but I would call your attention to the scheme worked out by the Public Health Service (Bull. 116), which has also been followed by the New York State Department of Labor in an examination of 481 lead workers.

There are some points of controversy in the field of lead poisoning. One of them concerns the relation of chronic plumbism to lesions of the kidneys. The earlier pathologists and clinicians, who, it must not be forgotten, had a far greater material to deal with than anyone can possibly have nowadays, believed that the contracted kidney of Bright, chronic interstitial nephritis, was as characteristic of plumbism as of alcoholism. Bright, himself, believed this; so did Tanquerel des Planches, the man who is called the Columbus of lead poisoning and who saw more than 1200 cases. So did Strümpell, Kobert, Oliver, and Osler. On the other hand, later authorities question whether there is any trustworthy evidence that lead has a characteristic action on the kidneys, and point to the undeniable fact that chronic nephritis cannot be produced in animals by the administration of lead. To this school belong Aub and Ophüls.

I have always been unwilling to reject the conclusions of the earlier men, but I do think that it is hard to prove the connection between plumbism and chronic nephritis and I think that one is justified in accepting such a lesion as occupational in origin only if the history shows unmistakable plumbism and very long exposure to lead. In England, where occupational poisoning is very carefully studied by experts for the Home Office, they accept as occupational the chronic nephritis of old potters. The men and women potters who are dying now in their late fifties, sixties and seventies with general arteriosclerosis and granular kidneys, went to work in the Staffordshire potteries at a time when conditions were very bad. They contracted lead poisoning early in life, and although the English pottery industry is now the best managed lead industry I have ever seen, still these old potters are believed to be suffering from the effects of their early plumbism and when they die from cardiovascular-renal disease, the English experts consider that the condition was caused by chronic plumbism, and I suppose that is a perfectly justifiable stand to take. But when a case comes up for compensation because of chronic nephritis, in which a history of typical lead poisoning is lacking and in which the exposure has lasted only a few years, I think it should be rejected.

What about gastric and intestinal ulcer in relation to lead poisoning? Many cases are being reported now by the Germans and Austrians which point to a close connection between such ulcers and the spasmodic contractions that occur during attacks of lead colic. Schiff insists that the causative relation between the two is clear; indeed, he holds that lead prepares the ground for the so-called neurogenic ulcers, whose origin is a recurrent spastic condition of the intestinal tract. Teleky reports a case of gastric ulcer in a zinc smelter who had a history of frequent attacks of colic; also a case in which a severe colic was apparently the cause of the lighting up of an old gastric ulcer. Adler of

Vienna reported a fatal case of colic, with bloody vomit, in a man who had had many attacks of lead colic. The autopsy in this case showed a ruptured gastric ulcer and the rupture was attributed to the severe contractions of the stomach under the action of the lead.

The solvents which are used now in industry are many and varied. Years ago all one needed to know about the painters' trade was lead, turpentine, naphtha, benzol, and wood alcohol. Now there is a list of solvents and thinners for lacquers, dopes, quick-drying paints, and paint removers which grows longer every year. Some of these same compounds are used as degreasers and for dry cleansing, others as solvents for rubber. A good solvent must be volatile or it cannot be used in industry, for it would dry too slowly. It must be a solvent for fats, and that means that it has a strong affinity for the lipoids of the central nervous system. These solvents are therefore volatile poisons with a narcotic action and, to a varying degree, with a damaging action of the liver and kidneys analogous to that which occurs in delayed chloroform poisoning.

The most dangerous solvent is coal tar benzol, which has an action quite different from any other. It is a poison to the bone marrow and the lymphatic system and chronic benzol poisoning is an aplastic anemia with hemorrhage as a marked feature. Industrialists recognize the dangerous character of benzol and many of them make a real attempt to substitute the homologue toluol, which is devoid of this particular action; but toluol is less abundant; it is more expensive, and it is somewhat less volatile, which makes it better for certain uses but not so good for others. I attended a hearing recently before the Committee on Public Safety on a bill to require all containers with benzol to be labeled "Poison," and in the course of that hearing I learned that benzol is much more commonly used than I had supposed. One of the most dangerous benzol-using industries has always been the making of cans for foods, when the sealing mixture consists of benzol-rubber cement. Many companies have substituted latex, the uncoagulated sap from the rubber trees, for benzol-cement but it seems that no less than one-third of all food cans are still sealed with benzol.

DuPont lacquer is not made with benzol but Dr. Gehrmann, of that company, informs me that there are cheap thinners for lacquer which contain benzol. The Committee on Public Safety was informed that the only good stains for floor and for woodwork are benzol stains, and that good floor wax contains benzol. It is also an essential element in the coatings for artificial leather and fabrikoid and is used by many makers of patent leather for shoes, and also in the cement for fastening rubber heels on shoes.

Carbon tetrachloride is widely used as a solvent for fats and gums, trichlorethylene is making its way into the same industries. About the former we have plenty of information, it is less narcotic than chloroform but more damaging to the liver and kidneys. About the latter, information from Germany indicates that it has a powerful narcotic action and that it produces a neuroretinitis, sometimes followed by atrophy of the optic nerve; and a paralysis of the sensory branches of the fifth nerve. This last action has led, as you will remember, to its use for the relief of facial neuralgia.

A typical nitrocellulose lacquer, what is often called a Duco lacquer, is composed of nitrocellulose dissolved in alcohols, denatured ethyl, normal butyl, and amyl and their acetates, and diluted with toluol or xylol, with or without naphtha, or perhaps carbon tetrachloride or trichlorethylene. There may also be that notorious poison, tricresyl phosphate, the cause of the "Jake paralysis," which followed the drinking of Jamaica ginger containing it as an adulterant. Many cases of alleged industrial poisoning from the spraying of lacquer are coming up at present and a wide variety of diseased conditions is attributed to their action. In such cases it may be necessary to have a chemical analysis of the coating in question before a decision can be made. If there is nothing in the lacquer more dangerous than those particular alcohols and acetates and toluol or xylol or naphtha, I should say that no serious damage could be attributed to the vapors given off in spraying. But it is important to remember that benzol may have been substituted at times, and that there may be such thinners present as the chlorinated hydrocarbons, including chloroform, and tricresyl phosphate, or one of its close relatives which, according to the Public Health Service, are also highly toxic.

MORTALITY RATES

Telegraphic returns from 85 cities with a total population of thirty-seven million for the week ending July 22, indicate a mortality rate of 9.5 as against a rate of 10.8 for the corresponding week of last year. The highest rate (17.8) appears for Schenectady, N. Y., and the lowest (4.7) for Yonkers, N. Y. The highest infant mortality rate (18.5) appears for Evansville, Ind., and the lowest for Bridgeport, Conn., Erie, Pa., Lynn, Mass., New Bedford, Mass., Schenectady, N. Y., Spokane, Wash., Tacoma, Wash., and Waterbury, Conn., which reported no infant mortality.

The annual rate for 85 cities is 11.3 for the twenty-nine weeks of 1933, as against a rate of 11.8 for the corresponding period of the previous year.—*Bureau of the Census.*

VERMONT STATE MEDICAL SOCIETY

BENIGN AND MALIGNANT TUMORS OF THE LUNG, BRONCHI, AND MEDIASTINUM*

BY DONALD S. KING, M.D.†

INTRODUCTION

DR. Rogers and Dr. Churchill have outlined for you the changes rapidly taking place in the treatment of pulmonary tuberculosis and chronic pulmonary suppuration. It is my object to show that a change is also taking place in the attitude toward lung tumors of both the benign and malignant types. I shall not attempt to give you a textbook discussion covering all possible sorts of thoracic tumors but shall confine myself to the problem as it has presented itself at the Massachusetts General Hospital in the last *two* years. I will have to be forgiven if I steal a certain amount of thunder from other men, for this is really the report of the work of a team known at the Hospital as the "Thoracic Clinic", consisting of Dr. Lord as internist, Drs. Whittemore and Churchill as surgeons, and Dr. Campbell Smyth as bronchoscopist. Though not actually attending the clinic, indispensable aid is given by Dr. Holmes and the X-ray Department and Dr. Tracy Mallory and the Pathological Department.

I shall present four groups of cases: (1) *Benign* tumors (usually *mediastinal*) which, in spite of their frequent large size, can often be successfully removed by present-day surgical methods. (2) *Bronchial* tumors: discussing briefly benign bronchial tumors but dwelling particularly on primary carcinoma of the bronchus and the possibility of its surgical treatment. (3) A different group of *malignant* growths which, at the time of observation, are usually *inoperable*. (4) Cases to illustrate problems of *differential* diagnosis.

I. BENIGN TUMORS (USUALLY MEDIASTINAL) CURABLE SURGICALLY

Figure 1 is the x-ray film of a girl of eight years who had been observed for six months with a neurofibroma arising from a sympathetic ganglion and gradually increasing in size. Surgery offered the only cure and Dr. Churchill removed the tumor successfully. Figure 2 shows the excellent result ten months after operation.

Figure 3 is the x-ray of a very interesting case which may prove to be a fibroma of the sort noted above. The patient is one of Dr. Mitchell Carey of Ludlow who found pathological chest signs on routine examination of an applicant for a summer camp and sent the patient to Dr. Rogers for x-ray. There had been no definite respiratory symptoms. We believe that this is a benign growth and, if not of the fibroma or neurofibroma type, is very likely a dermoid cyst such as is shown in the following slides.

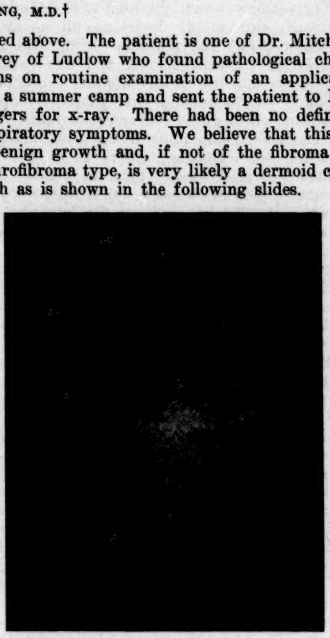

FIG. 5. Case of Dr. Wyman Whittemore. Dermoid cyst after artificial pneumothorax.

Figures 4 and 5 are from a patient of Dr. Wyman Whittemore showing a dermoid cyst sharply outlined because of an artificial pneumothorax which was done as a preliminary to operation. Figure 6 shows the condition eight months after removal. The patient is doing very well.

Figure 7 shows an echinococcus cyst which was successfully removed by Dr. Churchill.

Figures 8 and 9 are from another case of Dr. Whittemore's with what proved at operation to be an infected congenital cyst rather than an abscess or encapsulated empyema as was at first suspected.

II. TUMORS OF THE BRONCHI

One should have in mind first a group of strictly benign bronchial tumors, mostly fibromata and polypi. In 1930, Patterson[1] collected

*Read at the Annual Meeting of the Vermont State Medical Society at Burlington, October 6, 1932.
(Only a few of the slides used can be reproduced with this article.)

†King—Assistant Physician, Massachusetts General Hospital, in charge of Pulmonary Clinic. For record and address of author see "This Week's Issue," page 308.

16 cases from the literature where such a tumor had been successfully removed through the bronchoscope. Ashbury[2] reports a case where a fibroma four by one centimeter in size was coughed up from the bronchus.

Besides the group of strictly benign tumors,

FIG. 6. Same patient as in Figure 5, eight months after removal of cyst.

there is a very important group recently reported by Wessler and Rabin[3] of supposedly benign adenomata. This possible diagnosis is of vital importance in deciding the question of operation since at best these operations are radical and if they are to be undertaken, should be done only for certain malignancy. The authors mentioned report 17 cases of benign bronchial

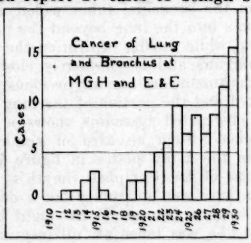

FIG. 10. Number of cases of primary carcinoma of the bronchus admitted yearly to the Massachusetts General Hospital and the Massachusetts Eye and Ear Infirmary. (Dr. George Holmes.)

tumors, 12 of which they have classified as adenomata. They admit, however, the possibility of these tumors becoming malignant.

Coming now to the problem of carcinoma of the lung, until recently considered of rare occurrence and hopeless prognosis, we believe that we are justified in making the following statement: Primary carcinoma of the lung is of frequent occurrence; it starts in the bronchi; in many cases the diagnosis can be made before the growth has spread beyond the bronchi; if diagnosed at this period, the growth can often be safely and completely removed.

At the Massachusetts General Hospital we are certainly making the diagnosis of primary carcinoma of the lung with increasing frequency. Figure 10, made from a table of Dr. Holmes', shows the number of such cases admitted yearly from 1910 to 1930. The marked increase is apparent. Since January 1, 1932, 18 cases have come to the Thoracic Clinic. More careful study of lung cases by x-ray and bronchoscopy is, in part, responsible for the recorded increase. There is a general tendency, however, to regard carcinoma of the lung as actually increasing in the population at large. This conclusion is based on autopsy reports from great hospitals all over the world. In every instance, these reports

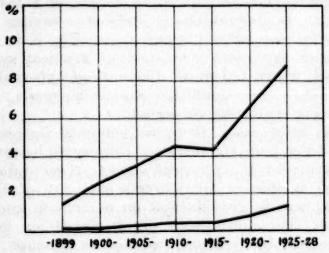

FIG. 11. Adapted from tables of P. D. Rosahn[4].
Upper curve shows autopsy percentage of primary carcinoma of the lung as compared with carcinoma of other organs. Lower curve shows percentage of primary carcinoma of the lung as shown at autopsy in comparison with total number of autopsies.

show that there has been a marked increase in the percentage of carcinoma of the lung found at autopsy as compared with the total number of autopsies performed. This percentage has increased rapidly since 1918. It is also true that autopsy reports show an increasing percentage of carcinoma of the lung as compared with carcinoma of other organs. These increases are graphically shown in figure 11, based on Rosahn's[4] tables which include all authentic reports up to 1930. Many explanations for this apparent increase have been given, the most reasonable one being that under present living conditions, the span of life has been extended farther into the "cancer age". A point which is left out of these discussions and which seems to me of importance is the probable increased hospitalization of lung cases of all kinds and increased interest in obtaining autopsies on the lung cases that have died in the hospital.

A study of the literature leaves little doubt as to the bronchial origin of so-called "pulmonary" carcinoma. There is, however, a great variation in the degree of malignancy in these bronchial tumors and their rate of infiltration and metastasis. Some tumors unquestionably malignant remain in the bronchus for long pe-

riods as in the case to be presented shortly. Others seem to spread very quickly to the regional lymph nodes and other parts of the body. At autopsy at least three-fifths of the cases show metastases, especially to liver, bones, suprarenals and brain. Fried[5], however, reports a case that lived seven years after a metastasis to the brain had taken place. Truly malignant growths, however, can often be diagnosed before they spread beyond the bronchi. It is important, therefore, to summarize briefly the evidence leading to early diagnosis.

The history in these cases is not characteristic since bronchial growth may give the signs of lung infection, such as cough, bloody sputum, pain, and dyspnea, and later, purulent sputum, fever, and cachexia. Carcinoma of the bronchus may, however, show earlier and more marked dyspnea; more persistent hemoptysis without other symptoms; or more severe and lasting pain. In general, one is justified in saying that in the case of a patient (especially if in the cancer age) with persistent or atypical symptoms, where a definite diagnosis of tuberculosis or other lung condition cannot be made, carcinoma should be suspected.

In most cases, then, we get only suggestive evidence from the history. Can we do better by a study of the physical signs? Some tumors, such as that in Dr. Carey's case, are of sufficient size to give flatness on percussion and to block the transmission of all breath or voice sounds. If, however, we are to attempt the diagnosis of early carcinoma of the bronchus, we must look for signs not from the mass of the tumor itself, but the signs given by a small tumor when it obstructs a bronchus.

With partial bronchial obstruction, before atelectasis of the lung has taken place, the physical signs are diminished breath sounds, diminished spoken voice, and diminished tactile fremitus. We believe that, too often, students in physical diagnosis are taught to look for the bronchial breathing of consolidation and not for diminished breathing of partial bronchial obstruction.

Chevalier Jackson also calls attention to the fact that a partial obstruction of a bronchus often gives musical râles over the area of lung supplied by that bronchus. This is the so-called "asthmatoid wheeze". This sign is probably more helpful in foreign body cases than in cases of tumor but it is at times of great value and, if not understood, may lead to a diagnosis of bronchial asthma when the true diagnosis is bronchial tumor or foreign body.

When a bronchus is completely obstructed, the circulating blood absorbs the air and there is total atelectasis of the lobe or lobes involved. The signs then are flatness, with absent breath sounds, absent voice and tactile fremitus, and displacement of the mediastinum toward the side of the lesion. These signs may be confused with those of fluid unless we note that the bronchial breathing and egophony almost always present over the upper part of the fluid are missing in the case of complete bronchial obstruction, as Dr. Lord has frequently pointed out.

As is true in practically any unusual case of lung pathology, we must depend in large measure on the x-ray for help in the diagnosis of early malignancy. Often the tumor mass is visible by x-ray, even though it has not extended beyond the bronchus. Figure 12 is the x-ray of such a tumor and figure 13 shows the pathological specimen.

Another point in x-ray diagnosis is one

Inspiration. Expiration.

FIG. 14. Case of Dr. Campbell Smyth. Obstructive emphysema due to non-opaque foreign body, a peanut, in the right main bronchus.

stressed by Manges of Philadelphia, that of "obstructive emphysema" shown in certain cases of partial bronchial obstruction. This phenomenon is due to the fact that during inspiration the bronchial tubes widen and allow air to pass into the lung beyond the partial obstruction, while during expiration the bronchus again narrows and is completely closed at the site of the tumor, and the air previously inhaled is trapped and the portion of the lung supplied by the obstructed bronchus shows a localized emphysema. Such an area of emphysema is shown in the x-ray plates in figure 14. This was a case of Dr. Campbell Smyth's. The obstruction here was not tumor but a non-opaque foreign body, a peanut, in the right bronchus. The first film was taken at full inspiration and shows the diaphragms at normal levels, the lungs about evenly aërated, but with the heart slightly displaced to the right as if the air had not entered this lung as well as it had the left. The second film, taken at full expiration, shows the right lung still expanded and the right diaphragm in the inspiratory position, demonstrating that the air had been trapped in this lung. The left diaphragm has risen, the heart has shifted to the left and the left lung shows the clouding often present in normal expiration.

As the obstruction becomes more and more complete, areas of atelectasis develop and are shown in the x-ray. It is often difficult to distinguish between the tumor itself and the atelectatic lung. Figures 15 and 16 show the gradually increasing atelectatic area in a case of progressive bronchial obstruction by carcinoma. Figure 17, also lent by Dr. Campbell Smyth, shows first a left lung almost completely collapsed because of a hemangioma in the main bronchus. The second film is taken after bronchoscopic removal of the tumor and shows the lung reëxpanded. Figure 18 shows the late stage of extensive carcinomatous involvement, the density in this case being due not to atelectasis but to the tumor mass itself.

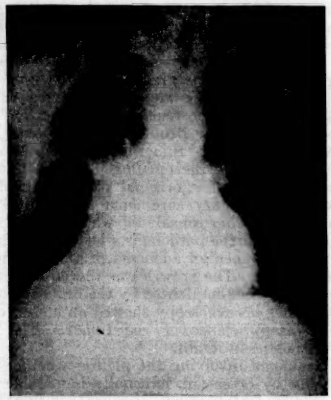

FIG. 16. Areas of atelectasis developing as a result of primary carcinoma of the right lower lobe bronchus.

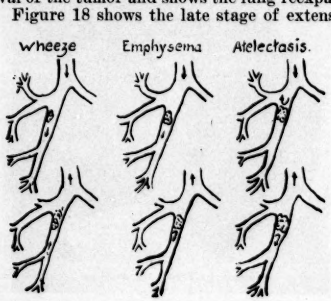

FIG. 19. Slide of Dr. Campbell Smyth, showing three stages in the development of bronchial obstruction by growth.

To summarize, we have noted three possible stages in the development of a bronchial growth as shown in figure 19 (Dr. Smyth's teaching slide): the first stage of diminished breathing and the asthmatoid wheeze; the second of "obstructive emphysema" as shown by x-ray; and the third, which is reached through intermediate stages of partial atelectasis, that of complete obstruction and complete atelectasis.

Lipiodol injected into the bronchus is of less importance in the tumor cases than in the bronchiectasis cases. But if there is bronchial obstruction, lipiodol will definitely localize it as is shown in figure 20, that of the tumor of which you have seen the photograph. Figure 21 also visualizes very strikingly a narrowing of the bronchus which three months later was shown to be due to a malignant growth.

If by reason of history, physical signs, x-ray findings, bronchoscopy, and pathological examination, an early carcinoma of the bronchus has been diagnosed, operation is the only cure. What are the recent developments in thoracic surgery which lead one to believe that such radical operation can be safely performed? The decision will rest, in the first place, on the exact location of the bronchial tumor. It is obvious that if the tumor is confined to a bronchus supplying one lobe of the lung, the involved bronchus and lobe of the lung can be removed more safely than if a larger bronchus is involved. The removal of one lobe of the lung for suppuration has lost much of its terror. In the case to be reported, the bronchial tumor involved the bronchus supplying both the middle and lower lobes of the right lung and the removal of these two lobes was successfully accomplished. Unfortunately, many of the tumors at the time of diagnosis involve a right or left main bronchus and, as yet, a successful attempt has not been made to remove an entire lung. Such a procedure, however, is not beyond the bounds of reasonable possibility.

The number of cases in the literature of successful removal of carcinoma of the lung are indeed few. Sauerbruch[6] has two cases to his credit and, at last report, these cases were living three and five years after the partial lobectomy. Harrington[7], of the Mayo Clinic has two cases that, at last report, were living but it had been less than a year after operation. In a recent number of *Surgery, Gynecology, and Obstetrics*, Allen and Smith[8] report one case apparently well fourteen months after operation. Figure 22 is the x-ray of Dr. Churchill's case. This patient was of great interest because she had had hemoptysis with few other symptoms for five years. She was finally admitted to the Rutland Sanatorium, and there, because of their plan of bronchoscoping suspected cases in whom they could not prove tuberculosis, a definite malignant growth was found. The only hope of cure in this case was radical operation and the fact that Dr. Churchill was able to remove these two lobes of the lung successfully was dependent in part upon very careful preoperative and postoperative care. Most cases of pulmonary carci-

noma in which radical removal has been attempted have died of pneumonia and in this case, in order to prevent pneumonia, pneumococcus vaccine, both autogenous from the patient's throat and stock from many strains of pneumococci, was given intravenously before the operation. Most bacteriologists agree that definite temporary immunity to the pneumococcus can

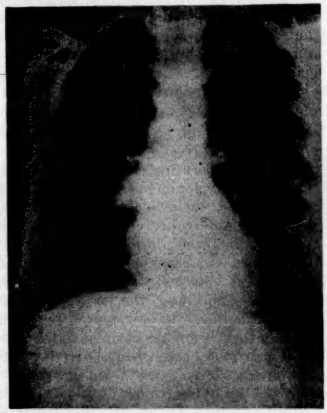

FIG. 22. Case of Dr. Edward D. Churchill. Primary carcinoma involving the bronchus to the right middle and lower lobes.

be given by such vaccination. This patient also had artificial pneumothorax so that the lung was completely collapsed at the time of the operation. A preliminary phrenic nerve crushing also removed the operative handicap of a continuously moving diaphragm. A well-given intratracheal anesthesia is of extreme importance in these cases and deserves part of the credit for the growing success of the thoracic surgeon. The final reason for the successful outcome in this particular case is, without doubt, Dr. Churchill's courage in doing a clean-cut lobectomy with the complete closure of the bronchus by suture and the sewing of the remaining lung over the stump. Figure 23 shows the specimen removed at operation. Whether a successful closure could be maintained if a main bronchus were cut across and a whole lung removed, we do not know.

Bronchoscopy having given us such important evidence in this case of persistent hemoptysis, it was done on the patient whose x-ray is shown in figure 24. The patient was an unusually healthy-looking man who had had intermittent hemoptysis for twelve months. Tubercle bacilli could never be found and three months of complete bed rest had not stopped the bleeding. Bronchoscopy showed no growth but only a very shallow bronchial ulceration of unknown cause. Strangely enough, silver nitrate applied through the bronchoscope stopped the bleeding completely and there has been no return during eighteen months. The diagnosis may, however, still be tuberculosis.

Figure 25 is that of a case with a malignant growth situated just below the opening of the right upper lobe bronchus. So far, it has been considered inoperable. This case was complicated by fluid, as are many thoracic tumors.

Figure 26 is that of a most interesting case that, for some reason, had tremendous dilatation of the stomach. At first we were inclined to ascribe the dullness and diminished breathing at the left base to high diaphragm secondary to distention of the abdominal organs rather than to bronchial obstruction and resulting collapse of the lung. Bronchoscopy, however, revealed a bronchial tumor located one-quarter of an inch below the opening of the left lower lobe bronchus. The original pathological diagnosis was papillary carcinoma and radical operation was being considered when further consultation with the pathologists left the diagnosis as a possibly benign adenoma of the type mentioned above. The growth was therefore treated by radium seeds implanted by the bronchoscopist and a later bronchoscopy showed an almost complete disappearance of the tumor. The end result is still in doubt.

Carcinoma involving the pleura, whether primary or by extension, is usually inoperable. It is usually accompanied, however, by fluid and the differentiation of this and tuberculous effusion is often necessary. In cases of doubt, a re-

FIG. 23. Same case as Figure 22, showing specimen removed at operation.

cent diagnostic refinement consists in removing the fluid, replacing it by air, and then inserting between the ribs an instrument resembling a cystoscope, called a thoracoscope. In such cases, a pleural growth may be directly visualized. Figure 27 is a case where chest tap showed bloody fluid. Figure 28 shows part of the fluid removed and replaced by air. Thoracoscopy showed definite white plaques of carcinoma of the pleura.

A word should be said as to the x-ray treat-

ment of carcinoma of the lung. Dr. George Holmes of the X-ray Department of the Massachusetts General Hospital believes that it is very unsatisfactory. Vinson[9] of the Mayo Clinic, however, still holds it of value and bases his contention on the fact that 10 of 71 cases of primary carcinoma so treated were still living on the average of 15 months after the diagnosis was made.

III. OTHER MALIGNANT TUMORS USUALLY INOPERABLE

Figure 29 is a case of sarcoma of the lung of such size that the mediastinum is greatly displaced away from the growth. Figure 30 is the autopsy specimen.

Figure 31 is that of a chondroma starting in a costal cartilage which at the time of operation had involved so extensively the chest wall and mediastinum that removal was impossible. The original x-ray diagnosis was fluid.

Figure 32 is a large lymphangioma.

Figure 33 is a small but highly malignant tumor originating in the wall of the esophagus and diagnosed by esophagoscopy and removal of a biopsy specimen. This growth, though small, gave intense pain which persisted over many weeks in spite of attempted relief by various nerve operations.

Figure 34 is the x-ray of a chest taken before metastasis from a *teratoma* of the testicle. Figure 35, five months later, shows the characteristic appearance of metastatic malignancy.

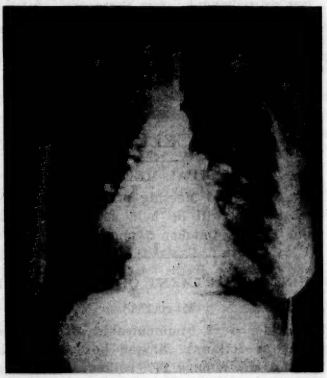

FIG. 36. Metastatic uterine carcinoma of the lung.

Figure 36 is a striking picture of uterine metastases. Figure 37, taken two months later, shows temporary improvement by x-ray treatment, but in figure 38, ten months later, the appearance is much like the original.

IV. DIFFERENTIAL DIAGNOSIS

It is well to consider briefly certain conditions which must be taken into account in differential diagnosis of lung tumors.

Figure 39 is that of Hodgkin's disease which might be rightly grouped with the malignant tumors. X-ray treatment is usually of marked benefit in these cases but in spite of the fact that biopsy on the cervical glands confirmed the diagnosis in this case and x-ray treatment was given, the patient developed fluid and died eight months later, three weeks after the above film was taken.

Figure 40 is a syphilitic with an aortic and

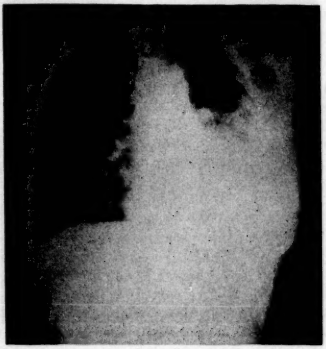

FIG. 43. Atelectasis of the left lower lobe due to stenosis of the left lower lobe bronchus from tuberculous ulceration.

innominate aneurysm. There are frequent warnings in the literature that in case bronchoscopy is done and biopsy specimen is to be removed, the bronchoscopist should be sure that the apparent tumor in the bronchial wall is not due to pressure from the outside by aneurysm. The attempt to take a specimen from such an area might conceivably be followed by a fatal hemorrhage.

Figure 41 is from a case of substernal thyroid. It will be seen that these cases might be confused with upper mediastinal tumors.

Tuberculosis is sometimes wrongly diagnosed as tumor. Figure 42 shows tuberculosis of the hilum glands in a case which also had tuberculosis of the skin and the cervical and axillary glands. The term "sarcoid" is applied to such cases or sometimes "non-tuberculous tuberculosis."

Figure 43 is a very interesting case of tuberculosis which was originally diagnosed asthma. Certainly, the x-ray film here shown has more the appearance of bronchial obstruction and atelectasis of the lower lobe than of tuberculosis. Physical examination also showed greatly diminished breathing and none of the characteristic signs of tuberculosis. The sputum, however, has contained tubercle bacilli on many occasions and bronchoscopy has shown a very marked stenosis of the left main bronchus apparently from an old tuberculous scar rather than new growth.

In figure 44, a definite diagnosis of carcinoma was made because of the shape and location of

the x-ray density. This case was given x-ray treatment and five months after the original diagnosis, the x-ray in Figure 45 was taken showing an area of diminished density like an abscess. Much to the surprise of the attending physician, examination of the sputum showed great numbers of tubercle bacilli.

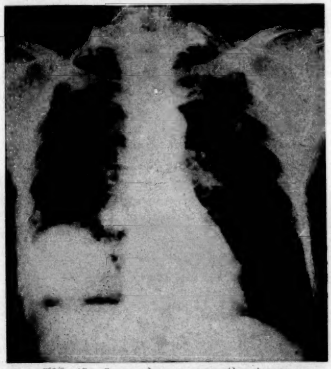

FIG. 47. Lung abscess suggesting tumor.

Secondary infection of carcinomatous areas often leads to mistaken diagnosis. Figure 46 is a case of carcinoma with secondary abscess formation.

The reverse may happen and a case originally diagnosed tumor as in figure 47 may be shown

FIG. 48. Same case as Figure 47, after coughing up sputum, showing area of diminished density and shifting fluid level. Operation showed abscess and not tumor.

the next day to have fluid within it with a shifting fluid level as in figure 48. At operation this case was proved abscess and not tumor.

Mistakes are made in cases of interlobar empyema which in the antero-posterior plate (figure 49) might be tumor but in the lateral plate (figure 50) has the typical appearance of pus between the right middle and lower lobes.

Figure 51 is that of an unusual case where the tumor shown by x-ray was due to a herniation of the omentum through the diaphragm.

CONCLUSIONS

Modern diagnostic methods are leading to earlier diagnosis of benign and malignant growths in the chest, and recent advances in thoracic surgery have made possible the successful removal of many of these growths. In case of any persistent lung symptoms or signs, where a definite diagnosis of tuberculosis or other entity is lacking, careful x-ray study should be made and when indicated, lipiodol, bronchoscopy or surgery employed. In cases of doubt, the time has almost come when exploratory operation on the thorax should give no greater alarm than exploratory laparotomy.

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MISCELLANY

ANNUAL MEETING

The next Annual Meeting of the Vermont State Medical Society will be held at Barre on Thursday and Friday, October 5 and 6.

VERMONT DEPARTMENT OF PUBLIC HEALTH

MAY, 1933

The incidence of communicable diseases during May was as follows: chicken pox 89, diphtheria 14, measles 115, mumps 147, poliomyelitis 1, scarlet fever 51, undulant fever 2, whooping cough 56 and tuberculosis 12.

Examinations done by the Laboratory of Hygiene totalled 1,707, classified as follows:

Examinations	for diphtheria bacilli	167
"	" undulant fever	22
"	" Widal reaction	26
"	" gonococci in pus	137
"	" tubercle bacilli	222
"	" evidence of syphilis	367

Examinations of	water, chemical and bacteriological	97
"	" water, bacteriological	250
"	" milk, market	218
"	" milk, submitted for chemical only	6
"	" milk, submitted for microscopical only	107
"	" foods	2
"	for the courts, autopsies	2
"	" the courts, miscellaneous	43
"	of animal heads for evidence of rabies	1
"	miscellaneous	39
Autopsies to complete death returns		1

Twenty-four new cases of gonorrhea and fifteen new cases of syphilis were reported to the Division of Communicable Diseases. Two hundred and seventy-four Wassermann outfits and 193 slides were sent out from the Department this month.

The nurses of the After-care Division of Poliomyelitis conducted the spring clinics at the usual centers with an attendance of 115 cases. The nurses made thirty home visits, one patient was admitted to the Audubon Hospital, ten orthopedic corrections were made to shoes and six pieces of apparatus were repaired. Sales amounting to $5.35 were made by the vocational worker of the division.

Nine towns were visited by the nurse of the Maternity and Infancy Division in the interest of the work of this Division. During the month, 513 notifications of birth registrations were issued.

JUNE, 1933

The incidence of communicable disease was as follows for the month of June: chicken pox 77, measles 278, mumps 50, typhoid fever 1, scarlet fever 24, undulant fever 1, tuberculosis 9 and whooping cough 28.

The Laboratory of Hygiene made a total of 1,778 examinations during the month, listed as follows:

Examinations for	diphtheria bacilli	120
"	" Widal reaction of typhoid fever	25
"	" undulant fever	59
"	" gonococci in pus	137
"	" tubercle bacilli	214
"	" evidence of syphilis	519
"	of water, chemical and bacteriological	123
"	" water, bacteriological	269
"	" milk, market	214
"	" milk, submitted for chemical only	14
"	" milk, submitted for microscopical only	5
"	" foods	5
"	for the courts, autopsies	3
"	" the courts, miscellaneous	19
Examinations of	animal heads for evidence of rabies	1
"	miscellaneous	50
Autopsies to complete death returns		1

Forty cases of gonorrhea and thirty-one cases of syphilis were reported to the Division of Communicable Diseases. Three hundred and sixty-seven Wassermann outfits and 129 gonorrheal slides were distributed.

The Director of the Division of Tuberculosis visited nine towns during the month conducting health plays in schools and giving talks on health to high school students.

The nurses of the Poliomyelitis After-care Division made 176 home visits, called on four doctors and supervised fifty orthopedic corrections to shoes. Two patients were admitted to the Children's Hospital in Boston and two admitted to the Audubon Hospital in the same city. Fourteen patients were visited by the vocational worker of this Division. Sales made for June by the vocational worker amounted to $13.30.

Thirteen towns were visited by the State Advisory Nurse of the Maternity and Infancy Division, conducting preschool clinics, home nursing classes and attending meetings of the P. T. A., Mothers' Clubs and Red Cross. Three hundred and ten pieces of literature were sent out and 352 notifications of birth registrations were issued.

NORTHEASTERN COUNTY MEDICAL SOCIETY

The annual meeting and banquet of the Northeastern County Medical Society was held Thursday evening, July 20, at the St. Johnsbury Country Club, with an unusually large attendance of members and guests.

After a most enjoyable banquet, the program of the evening was provided by a group of surgeons from Hanover, N. H. Dr. Cole and Dr. Miller spoke on "Trichinosis"; Dr. Bowler took for his subject, "Pyelograms as an Aid to Diagnosis," and Dr. Gile discussed "Compression Fractures of the Body and the Vertebrae." The addresses were illustrated by lantern slides and x-ray pictures.

New officers elected for the society for the coming year were as follows: President, Dr. J. M. Blake of Barton; Vice-President, Dr. C. G. Sherman of Newport; Secretary and Treasurer, Dr. E. A. Cramton of St. Johnsbury.

ADDISON COUNTY MEDICAL SOCIETY

At the annual meeting of the Addison County Medical Society, held Saturday, July 15, at Basin Harbor Lodge, Lake Champlain, the following officers were elected:

President: Dr. Estelle Foote, Middlebury.

Vice-President: Dr. V. W. Waterman, Vergennes.

Secretary-Treasurer: Dr. Sargent O'Connell, Middlebury.

Dr. J. P. T. Cummins of Ticonderoga read a paper on "The Failing Heart of Middle Age."

WINDSOR COUNTY MEDICAL SOCIETY

At the annual meeting of the Windsor County Medical Society, held at White River Junction, May 25, 1933, the following were elected as officers for the ensuing year:

President: Wm. M. Huntington, Rochester.
Vice-President: A. C. Walker, Springfield.
Secretary-Treasurer: A. L. Patch, Windsor.
Delegate for 2 years: A. L. Patch, Windsor.
Delegate for 1 year: B. A. Chapman, Springfield.
Alternate: Wm. H. Krause, Windsor.
Resolutions Committee: C. P. Munsell, South Royalton; Stanley Garipay, White River Junction.
Censors: A. C. Eastman, R. A. Whitney.

The speakers were J. F. Gile, Hanover, N. H. Subject: Depression Fractures of Spine. C. C. Stewart. Subject: Tuberculosis in Childhood.

RECENT DEATH

PRENTISS — ROBERT WALES PRENTISS, M.D., of Middlebury, died suddenly, May 30, 1933, of chronic myocarditis and acute dilatation of the heart, after being ill two days with a severe cold. Dr. Prentiss was born in Moretown, Vt., November 1872. He received his elementary education there and in Montpelier, Vt. He attended the University of Maryland and Baltimore Medical College, and graduated from the latter institution in 1901. He returned to Vermont that same year, was licensed and started practice. Dr. Prentiss was located in the village of East Middlebury before coming to Middlebury village itself.

The funeral services were held in the Methodist Church in Middlebury and were conducted in part by the local Masonic Chapter, of which Dr. Prentiss was a member. He was also a member of the Addison County Medical Society and was on the Staff of the Porter Hospital in Middlebury.

THE UNITED STATES DEPARTMENT OF AGRICULTURE REPORTS 111 SEIZURES IN JUNE UNDER THE FEDERAL FOOD AND DRUGS ACT

Some of the more important consignments of foods and drugs found to violate the national pure food and drug law are cited below. The Administration also sent to the Solicitor of the Department of Agriculture recommendations for prosecution of cases involving 50 stocks of foods and drugs and one of an insecticide.

Included in the seizures is a wide variety of medicinal products recommended for such diseases or disorders as headaches, asthma, hay fever, neuritis, nervous ailments, rheumatism, diabetes, skin disease, pyorrhea and other diseases of the mouth, as well as considerable stocks of foods which were found to be adulterated or misbranded.

The foods include vinegar, apple pomace, and other fruit products which carried residues of poisonous chemical sprays; partially decomposed crabmeat; butter which contained less than the legal quantity of butter fat; partially decomposed oysters; olive oil which was falsely labeled as to the contents in the bottle; flour and potatoes which were similarly misbranded, and other products.

In June, the Government seized 369 cases containing twenty-four 10-ounce packages each of "Brano Flakes" shipped by the W. K. Kellogg Co., Battle Creek, Mich., to a penitentiary in Illinois. The Government alleged that the food was labeled with false and misleading declarations in that the product contained only thirty-two per cent bran, whereas it was declared as containing more, and also misbranded in that the labels bore false and fraudulent therapeutic claims for such diseases as constipation, etc.

Another June seizure covered about 140 bottles of a product labeled as "Sanford's Compound Fluid Extract of Ginger." This drug preparation was consigned by the Potter Drug and Chemical Corporation, Malden, Mass., to a drug company in Providence, R. I. The fluid extract of ginger was labeled with false and fraudulent therapeutic claims in that it was recommended for diseases in the treatment of which it could have no value.

Mr. Campbell also reports the seizure of several hundred boxes of apples carrying residues of arsenic and lead spray sufficient to cause injury to health.

Approximately 72,000 gallons of vinegar were adulterated with arsenic and were destroyed.

June actions also covered destruction under court order of 590 cases of worm-infested or decomposed tullibees.

A contested case, involving a seizure of a number of cases of canned salmon, was decided, during the month, in favor of the Government. In rendering judgment, the court declared that he based his decision upon the fact that "he would give credence to experts who said this fish was bad at the time it was packed".

Criminal prosecutions terminated in June, or for which the Administration received notice of termination, resulted in the imposition of fines against the following manufacturers:

Raymer Pharmacal Company, Philadelphia, Pa., $300. The offense involved shipments of adulterated and misbranded pharmaceuticals. The drugs, including Caristol Compound, Calradine and Camphor Compound, and Capsules Amidopyrine, were adulterated in that their strength and purity fell below the professed standard and quality under which they were sold. The labels were false and misleading. The Caristol Compound also was labeled with false and fraudulent therapeutic claims.

Joseph G. Dubin & Sons, Inc., Brooklyn, N. Y., $100. Dubin had shipped from Brooklyn to Asbury Park, N. J., confections, labeled as "Pine Jellies," which were adulterated because they were artificially flavored and contained in their composition

(Continued on Page 301)

MALIGNANT TUMORS OF THE TESTICLE*

The Value of X-Ray Treatment

BY EDWARD L. PEIRSON, JR., M.D.†

MALIGNANT tumors of the testicle are very rare. Upon the average only one such case will be found in every five thousand hospital admissions[1]. However, as the literature on testicular tumors is very extensive, it is not our object to review what has been written on this subject. We wish only to give the end results on a series of cases and to present some facts dealing with the value of x-ray treatment, a phase of the subject about which there is little specific information in the literature. From the records of the Massachusetts General and the Huntington Memorial Hospitals, we were able to find fifty-one cases of malignant testicular tumors treated during the ten year period prior to 1929. Six of these cases were discarded because of lack of important data or because they had not been followed for three years. The remaining forty-five cases form the basis of this report. All living cases have recently been examined by me or some other member of the staff and except the two most recent cases that have lived only four and four and a half years respectively, they have all lived more than five years following operation. Although four years is much too short a period to judge the end results in most types of malignancy, it has been the consensus of opinion that metastases from malignancies of the testicle develop within such an interval of time. The fact that 90 per cent of all the cases seen in these two hospitals, during the period of time considered, have been followed for four years or longer, makes this a very interesting series.

The pathology of malignant testicular tumors has, in the past, been very much confused by the erroneous interpretation of the microscopic findings and is still confused by the multiplicity of names. It is now, however, generally conceded that there are at the most but two main types of tumors. First, there is the type of tumor which is evidently tridermal in nature and arises as the malignant growth of one or more of the three primary tissues which make up the typical teratoma. In such a growth there is a decided tendency for either the hypoblastic or the mesoblastic tissue in its malignant growth completely to obliterate the original teratoma. If only one slide is made, the primary tridermal origin of the tumor may not be seen. This fact accounts for a great deal of the confusion which has existed in the past. The second group of tumors is made up of typical large, round or polygonal cells with active hyperchromatic nuclei and abundant cytoplasm which are arranged in more or less solid masses. This type of carcinomatous tumor is considered by many observers to be a distinct pathological entity[1,2,3]. Chevassu called these tumors by the term "seminome" believing that they originated from the seminal epithelium. On the other hand Ewing[4] and others[5,6] believe that these carcinomas are derived not from adult tubular cells but from the one-sided development of a teratoma. The actual nature of testicular tumors is not of great clinical importance as they are usually all extremely malignant, although the latter type is said to be somewhat less malignant than the former. Generally, malignant tumors of the testicle like other carcinomas metastasize first to the regional lymph glands. True sarcomas of the testicle, contrary to past teaching, are now considered of an extreme rarity. The variation in the malignancy in different parts of the same tumor makes it wise to consider every teratoma as potentially malignant, and makes prognostication from pathological findings difficult. Unfortunately, we have been able to review the pathologic slides on only one third of the cases. In these we have been unable to correlate closely the clinical course of the cases with the microscope pictures. One case which was reported as "potentially malignant" developed metastasis six months after the first symptoms and died one year after operation. Barringer[7] found, as one would expect, a close correlation between the degree of malignancy and the response to radiation. However, we could not make any definite conclusions on this point, because the great majority of our cases were both highly malignant and highly sensitive to radiation.

The age at which malignant tumors of the testicle develop is much less than for other malignant growths. In our series the average age was thirty, the youngest being twelve and the oldest sixty-seven. Recently, we operated on an infant two weeks old and removed an embryoma of the testicle which was present at birth. As regards etiology some authors believe that trauma plays a part. Certainly, undescended testicles are more prone to the development of malignant growths than are normally placed organs. In fact, it appears from some of the most reliable figures that it is nearly 220 times more common[8] in undescended testicles. In our series eight per cent of the cases were in undescended testicles. Although, as has

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been shown by Cunningham[9] and Wangensteen[10], the operation of orchidopexy does not insure against the occurrence of malignancy in the testicle at a later date, this procedure still seems advisable because of the fact that if malignancy develops in an abnormally placed growth it is almost invariably fatal. Within the testicle in the scrotum any new growth is more easily identified and treated. On the other hand, when one considers the extreme rarity of the condition the prophylactic removal of an abnormally placed testicle which cannot be brought down into the scrotum seems hardly warranted.

The differential diagnosis of testicular tumors is not always easy but if one remembers that the epididymis is seldom if ever the seat of malignancy and is the usual location for inflammatory conditions, the problem is simplified. In any case of doubt, immediate operation is indicated, because even if a benign lesion is found it can probably best be treated surgically. We do, however, condemn the custom of removing the testicle without first opening the tunica vaginalis because if this is not done many testicles will be removed unnecessarily. If the cord is first identified and temporarily clamped with a rubber covered intestinal clamp there will be no danger of spreading metastases while the testicle is being delivered and exposed. If a benign lesion is found the clamp can be removed and no harm has been done.

The most common method of treatment of malignant testicular tumors is simple castration. The results of this operation as reported in the literature are discouraging. Tanner[11] collected 465 followed cases from the literature. Of these 81 per cent died and only 5.5 per cent were living and well four years after operation. In addition, he reported 88 followed cases of his own. Twenty-eight per cent of this series were living and well three years or more after operation, 52 per cent were dead and 19 per cent had lived too short a time to determine the outcome. The highest percentage of cures are reported by Cairns[6] who found 33 per cent of 55 cases to be cured. Chevassu[2] reported 19 per cent four year cures in a series of 100 cases. Many other writers including Howard[12], Coley[13], Hinman[14], Young[15] and Higgins[16] all estimate the percentage of cured cases as being less than twenty per cent. In any case it seems safe to conclude that at the most not more than 30 per cent of cures can be expected by this procedure.

Theoretically, the logical procedure should be to remove with the primary growth the lymph vessels and the regional lymph glands. Unfortunately, however, these glands are situated deep in the abdomen in the region of the renal vessels sometimes with an accessory gland in the iliac region. The actual removal of this gland bearing area in block as has been advocated by Hinman and others is a very extensive operation, requiring the retroperitoneal dissection of all the tissues from around the ureter and great vessels. Such a dissection to be of real value must remove all the retroperitoneal glands, which seems from purely practical considerations to be impossible[17]. In support of this radical operation Hinman[14] has reviewed the literature, covering 79 cases treated by the method and found in this series 26 cases where the glands removed showed definite metastases. Of these cases 16 are living and well, four over four years and eight nearly three years. Here, certainly, are some cases that have been cured by this procedure, which would have died following simple castration. Whether enough of such cases can be cured to offset the immediate operative mortality which must accompany such an extensive operation has not been definitely proved. Cairns[6] reported 31 per cent cures in 19 cases, no greater percentage of cures than he obtained by simple castration, while neither Hinman nor Young claims more than 30 per cent cures for this method.

The reports of the results of cases treated by x-ray or radium are more favorable. In the first place radiation can often control the metastatic growths which can be treated in no other way. There are innumerable reports in the literature of patients who presented themselves with large metastatic abdominal masses which completely disappeared following radiation. In these cases the patients often enjoyed good health for several years, the longest period of time being a case reported by Barringer[7] in which the patient has been well for ten years following radiation of a large metastatic abdominal mass. Furthermore, he reports that 18 out of 42 cases treated by radiation and castration are well three or more years afterwards. This 45 per cent of three year cures exceeds anything which could be accomplished by surgery even in more favorable cases. Of 113 inoperable or recurrent cases 36 per cent were free from disease. As regards prophylactic radiation in primarily operable cases, Dean[18] reports 24 patients in this group, 18 of whom were living and well, 13 from one to three years and five for more than three years. Although Higgins[16], Wesson[19] and others advocate radiation as a form of treatment, their published figures are not convincing.

The analysis of our series of cases is difficult because the cases have been under the care of a great many different men and there has been no definite plan of treatment for all cases. Purely as a matter of chance some have had x-ray treatment and some have not. In some cases the operation has been performed elsewhere and the patient has been sent to the clinic for the treatment of obvious metastatic lesions, or for the diagnosis of obscure abdominal symptoms which were found upon study to be due to metastasis. In this respect it is interesting to note that in many of these cases the correct diagnosis was at first not suspected because the patient did not tell the doctor that he had pre-

viously had a testicle removed and its absence was overlooked in the physical examination.

Another factor which makes statistical study difficult is the fact that due to the rarity of the condition, our series is of necessity a small one which must, of course, reduce the value of our conclusions. In this series there are only 45 cases, of whom 34 are dead and 11 or 24 per cent are living. Of these living cases we believe that ten are cured in so far as no metastases have been found and of this number six have lived over six years, two five years, and two four years or more. The other living case has metastases although they have been controlled by radiation for three years. In our series, four of the cases were inoperable when first seen and had no operation. Two cases only were treated by the radical Hinman operation and they are both well nine and ten years after operation without the benefit of x-ray treatment. The remaining cases all had a simple castration. Although there must of necessity be a very definite relationship between early operation and the percentage of cures obtained, our figures do not show it. This is, presumably, because in certain cases the malignant growth develops from a benign teratoma which has been present for some time. For this reason we have found it desirable to use the date of operation as a starting point in our computations.

Thirty-two of our cases received deep x-ray treatment, of which number, twenty-three had demonstrable metastases present when the irradiation was begun. Although we do not believe that such cases can be cured, the response to treatment has been very remarkable. Not infrequently large metastatic abdominal masses have entirely disappeared in a few weeks. In other cases, although the masses have not entirely disappeared, they have been greatly reduced in size, the patient's symptoms have been entirely relieved, he has gained in weight and strength and has been able to go back to work. Likewise, superficial metastatic glands and areas of metastasis in the lungs have also disappeared. Eventually, however, even in the most favorable cases there appears to come a time when the body is overwhelmed by generalized metastasis, and radiation is no longer of any avail. In the average case it seems possible to control the metastatic growth for only about six to eight months although in certain cases we have been able to control it for much longer periods.

In a few cases the records fail to show any real improvement following radiation, but in these cases the amount of radiation given was either quite inadequate or the patient was in the last stages of generalized carcinomatosis so that it was impossible to treat all the neoplastic growths efficiently. We agree entirely with Barringer who says, "Where irradiation has failed to control the tumor, analysis has shown that the treatment was insufficient." The minimum amount of radiation should in our opinion be at least two erythema doses (1600 "R" Units) given through each of the four portals of entry by an efficient, short wave-length machine in a three-month period. In many cases it may greatly exceed this amount. At the Massachusetts General Hospital at the present time treatments are given using 200 kilovolts and 4 milliamperes at a distance of 50 cm. with 0.5 mm. of copper and 4 mm. celluloid through a 20 x 20 cm. field. In carrying out the x-ray treatment it is of the utmost importance to remember a fact that has been overlooked by many radiologists; that the most common site for the development of metastasis from tumors of the testicle is in the lymph nodes around the renal vessels. Accordingly, the greatest amount of treatment should be given in the upper abdomen although, of course, both the lower abdomen and the operative wound should be treated as well.

The fact that radiation will make the patient suffering from metastasis much more comfortable for the remainder of his life cannot be questioned, but that he will live longer as a result of the treatment is more difficult to prove. Our figures do not show that radiation causes any marked increase in his life expectancy. This is due, we believe, to the fact that many of our early cases had inadequate and inefficient treatment. Certainly in some individual cases, the life expectancy has been greatly increased.

At the present time we have under treatment a man who came to the clinic three years and four months ago. At that time, which was a year and a half after the removal of the right testicle for an embryonal carcinoma, he was complaining of severe abdominal pain and loss of weight. Examination showed a large mass filling the entire right upper quadrant. Following his first series of treatments, an erythema dose to this area through each of two portals of entry, he was immediately and entirely relieved of his symptoms and the mass disappeared inside of six weeks. Three times metastatic lesions have been discovered in the chest by means of routine x-ray pictures and on each occasion the lesions have entirely disappeared following treatment. This patient has been seen regularly by us during this period and has had repeated x-ray treatments. A summary of his treatment is given in Chart I, which gives a good idea of what we consider adequate treatment. As a result of this he has a good deal of tanning of the skin but no serious skin changes and was made sick only by the first series of treatments. Until about six months ago he remained entirely free from symptoms

and no masses could be felt in the abdomen. At that time he again began to lose weight and complain of abdominal pain, which was once more entirely relieved by x-ray treatment. At the present time, over three years after the first developed metastasis, he is so far as subjective or objective findings go, entirely free from any growth and enjoying excellent health.*

An analysis of 200 cases reported in the literature and of our cases shows that on the average the length of life of patients who are not cured is only about one and one half years following the operation. Thus, it seems logical to conclude that this man who has lived nearly five years after an unsuccessful operation owes this extension of his life expectancy to radiation.

Another case (a carcinomatous degeneration of a teratoma) was first seen with metastases. These were controlled until last year when he finally died seven years after he was first seen. During these seven years he was treated by deep x-ray from time to time, receiving more treatment than any other patient, and for the most part enjoyed good health although the mass in the abdomen never entirely disappeared. In 1929 he suffered a pathological fracture of the hip which healed rapidly following one erythema dose. In 1930 a small recurrence appeared in the scrotum which was radiated and then removed. The pathological specimen appeared similar to the original growth which had been removed five years before, except that there was an increase in the fibrous tissue.

Our most encouraging results have been in a small series of nine cases which were treated by simple castration and prophylactic radiation. Seven of these are living and well four or more years after operation and two are dead, making 78 per cent of four-year cures. It is questionable whether the two cases that died had efficient prophylactic treatment. In one case, the amount of treatment is unknown as it was given elsewhere and the other case probably had metastases at the time, although they were not discovered until three weeks after the treatment was started. On the other hand, there were 15 favorable cases which were operated on and received no prophylactic radiation. Of these, only three or 20 per cent were living and well four years after operation. Although we realize very clearly that no definite conclusions can be drawn from such a small series of cases, we do believe that these findings have some definite significance. From our own cases and from a review of the literature it seems evident that operation alone, no matter what operation is carried out, will not give more than 30 per cent cures, a figure which we believe can be improved by combining orchidectomy with intensive prophylactic radiation.

*About seven months after this was written this patient again developed metastasis both in the abdomen and chest and is at the present time receiving further x-ray treatments.

CHART I

Summary of x-ray treatment received by one patient. When first seen over three years ago he had extensive metastases, but at the present time none can be demonstrated.

KV 200 Date	Filter CU ½m & CEL 4m. Area	Milliampere Minutes	Distance 50 cm. Field
8-7-29 to 8-11-29	Ant. abdomen	304	20 x 20 cm.
8-12-29 to 8-17-29	Post. abdomen	336	"
12-4-29 to 12-9-29	Ant. "	500	"
12-10-29 to 12-12-29	Post. "	420	"
6-11-30 to 6-16-30	Post. chest	550	"
6-18-30 to 6-23-30	Ant. "	500	"
8-7-30 to 8-20-30	Post. rt. upper abd.	500	"
8-21-30 to 8-28-30	Ant. rt. upper abd.	400	"
2-12-31 to 2-16-31	Post. pelvis	320	"
2-17-31 to 2-19-31	Ant. pelvis	280	"
2-24-31 to 2-25-31	Post. lumbar	320	10 x 20 cm.
		R. Units	
3-21-32 to 3-24-32	Post. chest	850	20 x 20 cm.
3-29-32 to 3-24-32	Ant. chest	780	"
4-5-32 to 4-10-32	Post. pelvis	870	"
7-6-32 to 7-21-32	Ant. rt. groin	500	10 x 10 cm.
7-25-32 to 7-27-32	Lat. rt. groin	800	"
7-28-32 to 8-3-32	Post. rt. groin	800	"
11-30-32 to 12-2-32	Post. chest	800	20 x 20 cm.
12-5-32 to 12-8-32	Ant. chest	735	"

SUMMARY

We have reported the end results on 45 cases of malignant tumors of the testicle and have emphasized the value of deep x-ray treatment in controlling the metastatic growths. Furthermore, we have presented some evidence tending to show that the greatest percentage of cures in this condition is obtained by a combination of orchidectomy and adequate prophylactic radiation. With this procedure in a small series of cases, we have obtained 78 per cent four-year cures as against 20 per cent in similar

cases where prophylactic radiation was not given.

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THE USE OF SODIUM PERBORATE IN THE TREATMENT OF CHRONIC PARONYCHIA DUE TO YEAST INFECTION

Preliminary Report

BY ETHEL M. ROCKWOOD, M.D.*

In the past, chronic paronychias have been most troublesome to both the surgeon and the dermatologist. The response to treatment has been slow, and in spite of incision, removal of the nail, hot soaks of various solutions, ointments (antiparasitic and otherwise), and exposure to the ultraviolet rays, the condition has remained more or less active over a period of several years.

The purpose of this preliminary communication is to call attention to an agent, namely sodium perborate, which thus far has proved most effective in the treatment of chronic paronychias due to yeast infection. The cases which form the basis of this report are taken from the dermatological clinic at the Massachusetts General Hospital and from private practice. In all cases scrapings from beneath the nail fold were examined and cultured. Although an extemporaneous preparation was at times negative, the clinical diagnosis was confirmed by culture in every case. Thus far the majority of the yeasts isolated have fallen into the Monilia albicans group.

The method of treatment is as follows: The patient makes a thick paste of the sodium perborate with a few drops of water. This is worked under the nail fold very gently with a small cotton-tipped tooth pick, and then packed around at the sides and under the nail. Without other dressing a rubber finger cot is drawn on and allowed to remain overnight. The purpose of the latter is to maintain and increase the moisture present. The patient is then instructed to soak the affected fingers three times a day in a warm solution of the sodium perborate made by adding two teaspoonfuls to half a glass of water, and to continue the soaking as long as effervescence takes place. This may be from one-half to three-quarters of an hour.

In a few preliminary laboratory tests in which various percentage solutions of the perborate were used, M. albicans was killed in from one to three hours. So long as active effervescence took place the solution was effective as a germicidal agent; this was apparently due to the liberation of nascent oxygen.

The treatment as outlined above has been most satisfactory. Cases of from three months to five years' standing which have received varied medication have been entirely cured in a comparatively short time, i.e., three to eight weeks. The relief from pain and soreness has been marked in from seven to ten days, often in less time, and the patient has been able to resume his former duties without discomfort, though he is asked to refrain from excessive amounts of soap and water.

In only two out of fifteen cases was there any complaint of pain when wearing the finger cot. This was due, apparently, to too tight a cot and to considerable secondary infection. This disappeared when the cot was temporarily discontinued.

The chief advantages of the treatment as outlined are its safety, its ease of application, and the shortening of the period of disability.

*Rockwood—Assistant in Dermatology, Massachusetts General Hospital. For record and address of author see "This Week's Issue," page 308.

TONSIL SNARE FOR EXCISION OF SEMILUNAR CARTILAGE

Preliminary Report

BY HARRY R. WHEAT, M.D.*

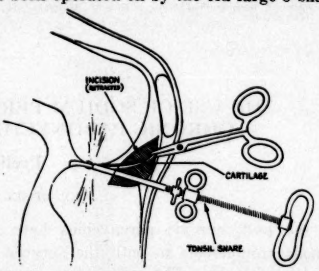
EXCISION of the cartilages of the knee, as one follows the technique described by Sir Robert Jones of England, becomes a fairly simple procedure and an operation which is particularly satisfactory in the good results which follow. The only difficult part in the operation is the final step, when the cartilage is excised.

If a knife is used for this final step, unless great care is exercised the cartilage of either the femur or tibia may be injured. There is also danger of leaving frayed ends of the remaining portion of the cartilage. Because of the lack of space, it is often difficult to excise more than the anterior half of the cartilage.

For the purpose of simplifying this final step, the writer suggests the use of a small tonsil snare. The wire must be especially prepared by giving a cutting edge to the wire loop, which comes in contact with the cartilage. This may be done with a half round file, after the snare has been threaded.

TECHNIQUE OF OPERATION. A two day preparation of the leg, from the ankle to the groin, and strict asepsis, as described by MacAusland, is of first importance. The use of an Esmarch's bandage will facilitate the procedure and no vessels need be tied, providing a pressure bandage or plaster cast be applied after removal of the cartilage. The leg is allowed to hang over the end of the table, after being carefully draped, including the foot. This rests between the knees of the operator who is seated on a stool, directly in front of the knee. In this way the joint space may be changed, as the operator desires, by manipulating the leg with his knees, thus allowing for better vision.

The most satisfactory incision is that described by Sir Robert Jones: "The incision need not be more than an inch or an inch and a half in length; it is made over the anterior end of the cartilage, sloping very slightly downward and inward—that is, nearly, but not quite, parallel to the upper edge of the tibia. Great care should be taken never to allow the incision to extend far enough to the inner side to cut any fibers of the internal lateral ligament; this is a fault which leads to weakness of the knee lasting for months or years, and is, unfortunately, still frequently to be met with in cases which have been operated on by the old large J-shaped incision described in text-books."



Drawing by Townsend

The joint opened in this manner allows ample room for exploration and necessary surgery.

With a small scalpel the anterior portion of the cartilage is freed from its attachments and grasped with strong forceps. The cartilage in the same manner is dissected free as far posteriorly as possible. The cartilage is then snared well back in its posterior half and fat tabs may be snared with a dull wire.

The joint is closed as usual in layers, and a temporary plaster applied.

*Wheat — Orthopaedic Surgeon, Springfield Hospital. For record and address of author see "This Week's Issue," page 308.

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REPORT OF THE COMMITTEE OF TWENTY FROM THE NEW HAVEN COUNTY MEDICAL ASSOCIATION TO REVIEW THE REPORT OF THE COMMITTEE ON THE COSTS ON MEDICAL CARE

"WE may be certain that the capacity to plan and manage human affairs successfully will be acquired only by long effort, by trial and error, by the hard discipline of experience. It is no simple undertaking that men have set out upon. It is no mere matter of drafting five-year plans and of devising schemes to do this and that."

(Walter Lippmann, Berkeley Address of March 22, 1933.)

"Sudden changes never save time. There's always the reaction to be gotten over with, if they're sudden. Gradual growths are what last. Now anybody who knows about changes of society knows that there's little enough any one person can do to hasten them or put them off."

(A. G. Keller, Man's Rough Road.)

PURPOSE OF THIS REPORT

The chief purpose of this report is to point out where we agree with and also where we dif-

fer from the conclusions of the Committee on the Costs of Medical Care—more particularly those expressed in the majority report—in their final summary, "Medical Care for the American People."

POINTS ON WHICH WE AGREE IN THE MAIN WITH THE COMMITTEE ON THE COSTS OF MEDICAL CARE

Before discussing certain points on which we disagree with either the Majority or the Minority Reports of the Committee on the Costs of Medical Care we think it only fair to point out that we are in substantial accord with a great many of their conclusions. We are acutely aware of the overcrowding of the profession, of the maldistribution of its members and of the lack of proper regulation of specialism,—all of which situations are stressed by the Committee on the Costs of Medical Care. We believe that these conditions can be remedied, by the education of those considering medicine as a career, by a continuation of the present policy of the medical schools of steadily raising the standards of medical education and by the continuation of the efforts of the profession to improve the quality of specialists. We would point out, however, that the educational part of this program will take time and that in the regulation of specialism the efforts of the medical profession must be aided by action on the part of the public having for its object the passage of legislation creating State Board regulations governing the practice of the specialties.

We quite agree, too, with the Majority Committee that the uneven distribution of sickness is a dominant factor in the production of financial hardship among the public in connection with illness. We doubt, however, that the situation is as urgent as they assume it to be for, after all, the problem is as old as medicine itself. We believe, with them, that this maladjustment must be corrected by some form of sickness insurance. We concur in the opinion of the Minority Report that any insurance scheme must be adequately safeguarded so as to prevent commercial or political control of the profession with the resulting tendency to reduce physicians to a level of uniform mediocrity. We further believe, in view of the fact that physicians received only 30% of the money expended on medical care, that their rôle in the production of the financial burdens of medical care has been overstressed and that the possibility of decreasing the cost of subsidiary services, particularly hospital service, must be seriously considered. We think that the low wage level of a large proportion of the population and its relation to the inadequate remuneration of the employees of industry has not received the attention it deserves as a factor in the burden of medical costs and that further study might show that it is a dominant factor.

Your Committee is in complete sympathy with many of the recommendations of the Majority Report as expressed in Chapter V, particularly their views regarding the strengthening of public health services, the necessity for adequately trained health officers, the increasing emphasis which should be placed on preventive medicine, the regulation of specialism and the necessity of increasing the opportunities for postgraduate instruction. We are also in complete accord with the view that physicians should be alert as to the changes which are occurring spontaneously in medical practice, that they should study and carefully evaluate new plans for improving the medical care of the public, and that they should take an active part in experimenting with procedures which give promise of success. The Committee feels very strongly, however, that on account of the varied local conditions existing in this country and because of our lack of knowledge of the principles underlying societal evolution, such experimentation should vary in different localities and should be tentative. We believe that the assumptions of the Majority Report that its members are possessed of prophetic vision (page 105, paragraph 5) and of a knowledge of the principles underlying social evolution sufficiently exact to permit the intelligent guidance of such evolution (page 58, paragraph 1) must be classed among those pious aspirations of the "warm-hearted but soft headed" who, actuated by an intense desire for social betterment, camouflage the fact that their Utopian schemes are based on inadequate data and insufficient knowledge by the use of high-sounding but empty phrases.

Your Committee approves in the main the recommendations of the Minority Report as summarized on page 151. They are unwilling to accept the second recommendation "that government care of the indigent be expanded" unless this is interpreted to mean that such matters should be guided by the local profession rather than administered through a general extension of political control. We think that the recommendations regarding the coördination of medical services are rather vague and that considerable thought must be expended and many investigations must be made before workable plans can be formulated. We entirely concur in the suggestion as to the desirability of restoring the general practitioner to the central place in medical practice, as urged also by Dr. Walter Steiner in the Majority Report, but are in doubt as to the steps necessary to bring this about. We agree with the members of the Minority Committee in unreservedly condemning the corporate practice of medicine. We believe that the County and not the State should be the unit in the development of new plans for medical care.

Your Committee desires to call attention to the value of the many publications which were issued by the Committee on the Costs of Medical Care during the course of their work. These

studies cover such matters as the extent of illness in the United States, medical facilities in the United States, capital investment in hospitals, the costs of medicine, studies of the cults, the income of physicians and various new methods of improving the medical care of the public. While this Committee cannot agree with all the conclusions which are drawn in these reports they feel that the material which has been collected is much of it of the very greatest value, and that the medical profession is under great obligations to the Committee on the Costs of Medical Care for its collection.

POINTS OF DISAGREEMENT

There are certain aspects of the problem of the adequate medical care of the public on which we wish to comment because we feel that the members signing the Majority Report have failed to realize their full significance.

In Dr. Wilbur's introduction to the final report this paragraph appears:

"As a result of *our* failure (italics ours) to utilize fully the results of scientific research, the people are not getting the service they need —first because in many cases its cost is beyond their reach, and second because in many parts of the country it is not available."

This quotation is, we believe, an indication of the fact that the Committee has underestimated certain factors which have a decided bearing on the present situation of the public as regards medical care. The quotation stresses the idea that many of the public do not receive adequate medical care *solely* because of defects in the organization of the medical profession. It ignores a very important factor in the situation which, however, is touched on in the report of the Majority Committee (Chapter I) when they remark that "there is a lag between scientific advance and popular appreciation" and that "the possibility of providing medical care for all depends in part on education which is frequently a prerequisite to change."

The point that we wish to make is that the Majority Report of the Committee on the Costs of Medical Care underestimates both the extent of popular indifference or antagonism to adequate medical care and the difficulty of changing this point of view. It is stated on page fifteen of the Majority Report that the sum spent by the public on patent medicines and practitioners of the cults amounts to $485,000,000 per annum as compared with $1,090,000,000 paid to regular physicians. These figures indicate that a large number of individuals buy patent medicines and treat themselves rather than go to a doctor, and that many people consider the services of cultists just as valuable as those of the regular medical profession. The actual figures *suggest* that in any one year over forty per cent of the sick do not desire to avail themselves of adequate medical care. Such a broad conclusion is, however, unjustified. Some of the sick undoubtedly purchase patent medicines because they are too poor to pay a doctor, and some of those who patronize cultists also employ regular practitioners. We know of no way of accurately estimating the exact percentage of the sick public who are indifferent or actively antagonistic to the idea of adequate medical care, but judging from the money spent on patent medicines and cultists an estimate of twenty-five per cent would probably not be too high. It is evident, therefore, that a very important part of any campaign to procure adequate medical care for the public will consist in educating a not inconsiderable portion of them to desire adequate medical care. It will, we think, take generations to accomplish this for it involves the complete abolition of fallacious and misleading advertising, the revision of the laws governing the sale of patent medicines and the education of the public with regard to the real standing of cultists and the real significance of cultism.

THE "ULTIMATE OBJECTIVE" OF THE MAJORITY REPORT

We come now to a consideration of Chapter III of the Majority Report, which is headed "An Ultimate Objective in the Organization of Medicine." This constitutes "the Committee's most fundamental specific proposal". In the opening paragraph they state that this type of medical organization "should be the major objective during the next twenty-five years of communities which seek to solve the problem of providing satisfactory medical service". It is the first of their "basic recommendations" described in the chapter on recommendations—(Chap. V).

Briefly stated, what the Majority Report of the Committee proposes is the organization of medical services in the form of groups of medical personnel connected with existing hospital or teaching centers, or with hospitals subsequently to be built, working under local boards. These local boards, which one infers would be composed mainly of laymen, may consist of existing hospital boards in some places, but in other places they would be "elected by popular vote or appointed by municipal or county officers". Each center would be under the financial and administrative control of "a well-trained executive, experienced in hospital and clinic administration and with a broad social background and a firm grasp of social as well as administrative problems". The professional personnel of such a center would be administered through an elected or appointed executive committee which would have the right to *nominate* (italics ours) members of the staff for promotion, retirement or removal. As an alternative, this function might be given to the

professional personnel as a body. In all matters primarily professional the staff would have control *subject to approval by the board and the director* (italics ours). It is assumed that all, or nearly all, the practicing physicians and dentists of an area served by such a center would become members of the staff.

The basis of remuneration would be "according to each practitioner's competence and responsibilities" and would be determined by the board of trustees, the director, and the chief of service or the executive committee of the staff. The rôle of the family practitioner would be prominent and respected. For such practitioners the center would choose "men with special aptitudes and training, with wide general knowledge of medicine, and some insight into psychology and social conditions". Each patient would be primarily under the charge of the family practitioner of his choice, provided the latter was not already fully burdened, and might at his option change to one of the other physicians.

It is clear, we think, from this description that what the Committee proposes is *group medicine* with country-wide distribution under the control of lay boards which would, for the most part, be *politically* appointed. We will discuss separately our views on group medicine and on the political control of medicine.

GROUP MEDICINE

In their Chapter on Recommendations (Chapter V) the members of the Majority Report word their first recommendations as follows:

"The Committee recommends that medical service, both preventive and therapeutic, should be furnished largely by organized groups of physicians, dentists, nurses, pharmacists, and other associated personnel. Such groups should be organized, preferably around a hospital, for rendering complete home, office, and hospital care. The form of organization should encourage the maintenance of high standards and the development or preservation of a personal relation between patient and physician."

There is no doubt that in certain places, under favorable local conditions, group medicine has been successful. It has its advantages and its disadvantages like any other human contrivance. These are fully discussed in the Minority Report on pages 159 to 163. In our opinion the secret of the success of the group plan in certain places has been the active leadership and domination of the group by some particularly forceful and sagacious individual. Where group medicine has failed, and it has been a failure in some places, adequate leadership has probably been lacking.

The last sentence in the first recommendation of the Majority Group that "the form of organization should encourage the maintenance of high standards and the development or preservation of a personal relation between patient and physician" expresses a point of view which we regard as little short of extraordinary.

We know of no evidence that organization *per se* encourages the maintenance of high standards. The colleges of this country are all of them organized along very similar lines and yet the standards of some are deplorably low. Piracy is a coöperative form of organization but we should hardly care to accept its standards; the same is true of bootlegging. High standards are not dependent on organization but on the *spirit* which pervades an organization. This spirit is the reflection of the standards and ideals of the group of individuals who are associated in the organization.

The idea that any form of organization will develop or preserve a personal relation between patient and physician which is comparable to the best type of relationship between a family doctor and his patients seems to us almost ludicrous. Physicians who have had experience both in private practice and in dispensary or hospital work know that dispensary and hospital patients do *not* bear the same relation to their medical attendants as private patients. The very nature of institutional work, with its changing staff and varying body of patients, precludes the development of the intimate relation of patient to family doctor which only reaches full maturity after years of contact. It is possible that in group practice with home visits a more stable relationship between physician and patient might be developed than that which usually exists in this type of practice, but even so in the hospital and dispensary activities of the group, conditions would be similar to those which exist at present.

Your Committee therefore believes that while group medicine has succeeded and may continue to succeed in some places, there is no particular virtue about it which should lead to its being singled out as *the* method most likely to succeed as a nation-wide plan of caring for the sick.

THE POLITICAL CONTROL OF MEDICINE

It is obvious that under the type of group medicine proposed by the Majority Report the control of the medical groups would fall, in many places, into the hands of boards of administrators or trustees "elected by popular vote like school boards, or appointed by municipal or county health officers". As the Majority Report states, "the method of appointment is relatively immaterial, so long as the members are interested, competent, devoted to the general good, and *free from political interference*" (italics ours). How a politically appointed board can be free from political interference, they do not say. It is assumed that these boards

would be composed of laymen who would serve without pay. Their executive officers, who would certainly have to be paid, would be trained men whose qualifications are described in the language of the uplift in the section of the report recently quoted. The physicians who served these boards would be appointed or discharged by the boards, for, it should be noted, the professional personnel has only the power of *nomination*, and in fact, can only conduct its professional activities *subject to approval of the lay board and the directors*. The directors might perhaps be physicians or possibly some of the Ph.D's, with which the country is now inundated, might be chosen.

The way in which political bodies function is no secret to the members of this Association, and we can see no reason to believe that politically appointed medical boards and their politically appointed executive officers would act any differently from similar bodies in other fields of effort. Work which is done under political auspices is nearly always incompetently done, it is usually expensively done and it is often corruptly done. There are opportunities for favoritism and nepotism, not to mention graft. The spur of individual competition, which has undoubtedly been the most important factor in all progress, is lacking. There is a tendency for employees to reach a dead level of mediocrity.

Your Committee believes that the country-wide adoption of such a plan would have a disastrous effect on the morale of the medical profession, would damage rather than help the medical interests of the public and would be more expensive to operate than the present system.

In conclusion we would call attention to the fact that the members who signed the Majority Report of the Committee on the Costs of Medical Care were obviously in doubt as to the advisability of suggesting any concrete plan. To illustrate this point we quote from their chapter on recommendations:

"The problem is complicated and differs from one region to another. No panacea is available; no solution is applicable today to all areas of the country." And later the following appears in discussing the population distribution of the United States: "Among these population groups there are wide variations in cultural attainment and in standards of living. This means that there are wide variations in the kind of medical service which is demanded. . . . No single plan therefore, is adaptable to all of America's regional variations in economic resources and activities, cultural and educational developments, density of population, and social attitudes." In spite of their own statements the members of the Majority Committee then proceed to formulate an ultimate objective, which is the definite plan already discussed in the earlier part of this report.

It is difficult to understand the state of mind of a group of intelligent individuals who point out the impracticability of doing something and immediately proceed to suggest a way to do it. We think the Committee on the Costs of Medical Care would have been in a much more influential position if they had been satisfied to present alternative plans, recognizing as they plainly do that a uniform plan is not applicable to all parts of the country, and if they had suggested that these plans be tried out locally and on a small scale in order to test out their practicability. Certainly, there is nothing in the history of the medical profession that indicates any lack of willingness on their part to try out new methods of serving the public. A number of these have appeared in recent years and most of them have been the product of medical minds. We believe that the medical profession is in a much better position to suggest changes in organization which are likely to work than a committee, many of whose members are laymen with no practical experience in the everyday problems of the medical profession. It may be that the Majority Committee was swayed by the spirit of the times, the dominant note of which is plans and planning. It is only necessary to read the daily newspapers to realize this. We have five-year plans, three-year plans, four-pronged plans, etc. Most of these represent the endeavors of individuals or groups of individuals to squirm out of uncomfortable maladjustments which are very largely the result of the present economic situation. Many of the plans proposed have already demonstrated their futility. What is needed is not a rigid plan, but an intelligent study of the working of existing or promising new plans in various parts of the country, where particular ones appear adaptable, better education of the public regarding the advances and the limitations of modern medicine, a certain amount of professional reorganization along the lines mentioned in the early part of this report, a continuation of the collection and study of facts bearing on the costs of medical care, and an unlimited amount of patience. We present this report not as a collection of conclusions, but rather as a series of suggestions for professional study and experiment.

SUMMARY

1. Your Committee believes that the Medical Profession is deeply indebted to the Committee on the Costs of Medical Care for their numerous factual reports on conditions which bear on the question of medical costs.

2. We substantially agree with many of the conclusions of both the Majority and Minority Reports of the Committee on the Costs of Medical Care.

3. We emphatically dissent from the view

of the Majority Report, that the country-wide adoption of a politically-controlled plan of group medicine would "solve the problem of providing satisfactory medical service".

4. We are of the opinion that the final report of the Committee on the Costs of Medical Care overstresses the responsibility of the Medical Profession for the present situation and underestimates the responsibility of the public, including the employers of labor.

5. We are convinced that the existing maladjustments in medical service can be remedied by coöperation between the public and the medical profession, but we believe that this involves protracted education of a considerable portion of the population, and the gradual reorganization of the medical profession. This will tax our good will, our ingenuity and our patience to the utmost and cannot be brought about, in our opinion, by any sudden and radical change. It must come gradually through education and piecemeal experimentation if it is to endure.

NEW HAVEN COUNTY MEDICAL ASSOCIATION
129 Whitney Avenue,
New Haven, Conn.

THE UNITED STATES DEPARTMENT OF AGRICULTURE REPORTS 111 SEIZURES IN JUNE UNDER THE FEDERAL FOOD AND DRUGS ACT

(Continued from Page 290)

neither pineapple fruit nor pineapple juice and because the covering was not pure milk chocolate. The misbranding charge was based upon the allegation that the label contained false and misleading statements. Dubin was also fined, under another charge, $100, for making interstate shipments of adulterated and misbranded hard candy. The candy was misbranded within the meaning of the Federal food and drugs act in that the labels bore false and misleading declarations as to the true constituents of the confection, and adulterated with undeclared artificial color and flavor.

Sweets Company of America, Inc., New York, N. Y., $200. This company violated the national pure food law by shipping adulterated and misbranded candy. The candy, labeled as "Grape" and "Raspberry," was adulterated with artificial flavor and color.

William W. Barnum, trading as McKean County Creamery, Smethport, Pa., $50, and costs. The fine was imposed because the company made interstate shipment of adulterated and misbranded butter, containing less than the eighty per cent of milk fat required by the law. The quantity-of-contents statement was false and misleading. The butter had previously been seized by the Government.

A GRANT FOR THE RESEARCH WORK ON THE NERVOUS SYSTEM

A grant of $58,500 to the Washington University School of Medicine from the Rockefeller Foundation toward the expense of conducting a five-year research project in the physiology of the nervous system was announced recently by Chancellor George R. Throop. This grant will provide for the expansion of a comprehensive program of research on the nervous system, which has been under way in the School of Medicine for a number of years and in which several of the departments of the school have coöperated. The work to be done under the present grant will be conducted chiefly by Dr. George H. Bishop, Professor of Biophysics in the Washington University School of Medicine, and by Dr. S. Howard Bartley, Research Associate of Biophysics and Psychology. The work will be done in the laboratories of the Oscar Johnson Institute for Research in the medical school group.

"The work which is now to be undertaken," said Dean W. McKim Marriott recently, "is based on the fundamental series of investigations on the nature of nervous activity carried out by Dr. Joseph Erlanger and Dr. Herbert S. Gasser and their associates in the Department of Physiology of the School of Medicine. Drs. Erlanger and Gasser were successful in perfecting a new method for the study of activity of the nervous system through measurement of the minute electrical currents associated with the nervous impulse. Early in the course of this investigative work it became evident that a correlation of the studies in pure nerve physiology with structural and microscopical observations of the nervous system, with psychological, biochemical, pathological and surgical observations would be advantageous. The field of investigation was accordingly broadened through the participation of members of a number of departments in the School of Medicine in addition to those in the Department of Physiology. So fruitful have been the findings that the time has now come when further expansion is distinctly desirable. The facilities offered by the new Oscar Johnson Institute, together with the grant from the Rockefeller Foundation, have made this extension of the work possible.

"Much of the ground work in the analysis of typical nerve activity has been done and the remainder will be carried out as occasion arises. The next step is to study not merely nerves but nervous function in the living body and the ways in which such function is disturbed as the result of injury and physical or mental disease. While the experimental approach is from the side of nerve function, the possible ramifications of such problems are very extensive." The work now under way in the Department of Physiology and other departments of the School of Medicine will be continued. The entire project represents one of the most ambitious research programs ever undertaken by a medical school in the United States.—*Bulletin of the News Bureau, Washington University.*

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 19321

GLYCOSURIA, HEPATIC INSUFFICIENCY AND DEATH IN COMA WITH HYPERPYREXIA BUT WITHOUT ACIDOSIS

MEDICAL DEPARTMENT

PRESENTATION OF CASE

DR. HENRY D. STEBBINS:* A fifty year old Italian storekeeper entered the hospital with pain in the right shoulder and right side of six months' duration.

First admission. He was previously seen twenty-four years earlier and was operated upon for a fistula in ano. Previous to this admission he was seen in the Outpatient Medical Clinic, where a gastro-intestinal series was done and found negative. The urine was positive for sugar.

Second admission. Six months before entry he first noticed occasional pain in the right anterior chest and right scapular region, worse on motion. At the same time he had frequency of urination. Two months before admission the pain became constant and varied in intensity only on motion. Nothing else seemed to affect it. He also noticed tenderness over the right shoulder blade, so severe that it awakened him at night when he turned over. He also had slight pain in the midepigastrium when the shoulder pain was worse. He had marked increase in polyuria and began to have nocturia five to seven times. Polydipsia and polyphagia became noticeable. He lost fifteen or twenty pounds in the six months before admission. He had occasional night sweats during that time.

The family history was negative.

In giving his past history he said he took two or three drinks of beer a day. Other informants said that he had been a heavy drinker for years. One year previous to admission he had painless jaundice for ten weeks, stopping when he discontinued his beer drinking. He resumed beer drinking, however, after the jaundice cleared. He felt bloated after meals. He did not notice the color of his stools. He was not ill in any other way. He denied venereal disease.

Physical examination showed a fairly well nourished man in no discomfort. No icterus was noted. There was peripheral and retinal arteriosclerosis. The gums showed bleeding. The heart was normal in size and its sounds were of fair quality. There was a blowing systolic murmur heard at the base. The pulmonic second sound was louder than the aortic second. The blood pressure was 140/90. The liver edge was two to three fingerbreadths below the costal margin and tender. The spleen was palpable one fingerbreadth below the costal margin. He had no edema and no ascites. There was slight clubbing of the fingers.

On laboratory examination the urine showed olive green and orange Benedict's tests for sugar but was otherwise normal. The red cell count was 3,500,000, the hemoglobin 70 per cent, the white blood cell count 6,500. There were six per cent monocytes. One blood Hinton test was negative, one Wassermann weakly positive. The tests were repeated at the State laboratory and both were negative. The blood cholesterol was 136 milligrams per 100 cubic centimeters, the icteric index 40, the van den Bergh 4.74 milligrams per 100 cubic centimeters, direct reaction. A liver function test showed 45 per cent retention of dye. The blood sugar was 212 milligrams per 100 cubic centimeters. The renal function was normal. The stools were brown. An intracutaneous test with potassium ferrocyanide was done on account of the possibility of hemochromatosis, but this showed no iron present.

On account of the questionable luetic history a lumbar puncture was done. It showed normal dynamics. The spinal fluid gave strongly positive ammonium sulphate and alcohol tests, colloidal gold 1333322110, Wassermann negative.

X-ray examination showed a normal heart and clear lung fields. The spine was particularly examined on account of the pain in the intrascapular and right scapular regions. It was normal except for slight lateral curvature.

The teeth were poor, though there were no abscesses. Several teeth were removed, as it was felt advisable to clear up all foci of infection on account of the diabetes. Following extraction he became irrational and very intractable, and left the hospital against advice at the end of a week.

Third admission. He returned to the Emergency Ward two days later in great distress, having been apparently fairly well until the evening of readmission, when he suddenly became weak and dyspneic, perspired freely, and noticed that his heart beat very fast. His doctor gave him a hypodermic with slight relief and sent him to the hospital.

Examination was very much as before, plus marked orthopnea. He was very cyanotic and sweating slightly. Carotid pulsations were visible, but none were seen in the veins, which were not engorged. The mouth was dry. The blood pressure was 90/60, as against 140/90 on the previous admission. The pulse was 220, regular, of good quality. Pressure on the eyeball and vagus pressure had no appreciable effect on the pulse.

*Recently senior interne on the East Medical service.

There were rare râles at the lung bases. The liver was two to three fingerbreadths below the costal margin, not tender. He had a temperature of 104°. A Benedict's test on the urine was brown.

He was given quinidine throughout the night. By morning his pulse had dropped to 100 and his temperature to 99°. Two days after admission the temperature again rose to 105° and during the next four days slowly subsided. The chest was negative by x-ray. The urine was examined and he was gone over very carefully for foci of infection, but no cause for the fever was ever found. He was put on a diabetic diet with high carbohydrate, 130 grams, and given insulin 30 units a day. The diabetes was gradually controlled.

An electrocardiogram showed low T_2, inverted T_3 and slight left axis deviation. The icteric index was 40, the van den Bergh 3 milligrams per 100 cubic centimeters.

He was discharged sugar free with his diabetes under good control.

History of interval. He was well until four days before readmission. His wife had been giving him daily forty instead of thirty units of insulin, the dose on which he had been discharged. Four days previous to reëntry he gradually became weak and more hungry. Two days before readmission he ate two dinners at night and then became somewhat irrational. The day before admission at four o'clock in the morning he awoke crying out loudly and completely irrational. He was quieted with morphia and became unresponsive, remaining so until he came to the hospital. He had been given insulin that evening in spite of the fact that the urine test showed no sugar. On admission he had been unresponsive for eighteen hours.

Fourth admission. He was readmitted twenty-five days after his last discharge.

On examination he was rolling about and pulling his knees up as if he had considerable abdominal pain, also grasping his head and crying out as if in pain. He recognized nobody. His skin was dry. There was no hyperpnea and no acetone breath. The pupils were dilated but reacted normally. The heart sounds were as before. The blood pressure was 130/80. The liver was four fingerbreadths below the costal margin, the spleen three fingerbreadths below. There was clubbing of the fingers as before.

The urine showed a blue test for sugar. The white cell count was 14,000. The blood sugar fasting was 338 milligrams per 100 cubic centimeters.

He was given a liter of five per cent glucose on the shock table and immediately became active but not responsive. He was irrational still and recognized no one except his wife. He complained of a pain in the head. His temperature rose during the next two days to 105°. He remained in comparative stupor in the ward, unresponsive, noisy and very restless. He recognized his wife for two or three days beginning two days after admission. Otherwise he could not obey any commands or coöperate at all. He was carefully examined again for sources of the temperature of 105°, which persisted for six days. There were moist râles at the right lung base, but no increase in the respiratory rate and no bronchial breathing. One specimen of urine was loaded with white cells, but a second showed only ten to fifteen white cells. We were unable to obtain another specimen of urine on account of incontinence. The white cell count continued about 16,000. The icteric index and van den Bergh were approximately the same, 35 and 3.75. A liver function test showed 45 per cent dye retention. He gradually became quieter, although the temperature never fell and the white count did not increase. He expired five days after admission.

Clinical Discussion

Dr. George W. Holmes: The films that we have were taken on the first admission and are essentially negative.

Dr. Stebbins: The discharge diagnoses were cirrhosis of the liver, diabetes mellitus, questionable bronchopneumonia.

Dr. William B. Breed: I have nothing to add except to say that we were sure that his coma was not caused by the diabetes, which was under good control. We were unable to demonstrate any pathology in the lungs, which were under suspicion.

Dr. James H. Means: Can you have hemochromatosis without any skin pigment?

Dr. Tracy B. Mallory: Yes.

Dr. Means: The combination of diabetes and cirrhosis here seems to be very significant.

Dr. Paul D. White: Was the clubbing of his fingers pronounced?

Dr. Frederick T. Lord: They were rather peculiar fingers,—rather a broad nail, was it not, Dr. Stebbins?

Dr. Stebbins: The clubbing was not very marked but quite definite.

Dr. Lord: How long did the first febrile disturbance last?

Dr. Stebbins: On admission his temperature was 104° and rapidly dropped to 99°. The next day it rose to 105°, then subsided gradually during the next two or three days.

Dr. Breed: Did he ever have a chill?

Dr. Stebbins: None was observed.

Dr. White: There was nothing found in the heart suggesting subacute bacterial endocarditis?

Dr. Stebbins: No, sir.

A Surgeon: Was the blood urea recorded?

Dr. Stebbins: No, it was not determined.

Clinical Diagnoses (from hospital record)

Diabetes mellitus.
Cirrhosis of the liver.

ANATOMIC DIAGNOSES

Cirrhosis of the liver, alcoholic (?)
Jaundice, moderate.
Pyelonephritis.
Arteriosclerosis, aortic and coronary, moderate.
Chronic fibrous pleuritis.

PATHOLOGIC DISCUSSION

DR. MALLORY: The autopsy on this man showed two very important lesions. One was a very marked cirrhosis of the liver, slightly hypertrophic in character. The liver was a little larger than normal. It was very definitely hobnail. There was no striking jaundice.

The other finding was a very marked bilateral pyelonephritis with multiple abscesses scattered throughout both kidneys, undoubtedly the cause of his terminal fever.

Microscopic examination of the liver shows a marked cirrhosis of the portal type without any fat vacuolization of the liver cells and also without anything that I can recognize as hyaline degeneration of the type ordinarily found in alcoholic cirrhoses. There is a slight amount of iron present, but not enough to justify the diagnosis of hemochromatosis. A very considerable proportion of cases of alcoholic cirrhosis, at least 20 per cent of them, show more or less excessive iron pigmentation, a few of them very definite hemochromatosis combined with it. In spite of the absence of hyalin I should be inclined to think that this man's primary disease is alcoholic cirrhosis of the liver with a superimposed very early hemochromatosis. I do not think that is an adequate explanation of the diabetes and certainly not the whole explanation of his cirrhosis.

The pyelonephritis is just a terminal event, entirely unconnected with the cirrhosis.

DR. MEANS: Did the pancreas show anything?

DR. MALLORY: Nothing that we could make out. That is our usual experience with diabetes.

CASE 19322

ANEMIA AND WEAKNESS OF DOUBTFUL ORIGIN

MEDICAL DEPARTMENT

PRESENTATION OF CASE

DR. F. DENNETTE ADAMS: This is a case of Dr. R. B. Greenough's, an American seamstress sixty years old, admitted on the nineteenth of January.

Her past history was irrelevant. She had an appendectomy at thirty, and at the same time the right ovary was probably removed. A year after this she had an operation for hernia. She had had pneumonia twice.

The present illness began six months prior to her admission here. At that time she was operated upon in New Jersey for a small tumor on the surface of the skin below the right breast and apparently not a part of the breast. She recovered from the operation without complications and returned to her home in Boston, getting along perfectly well until a month before admission. She then had an attack of what was called intestinal grippe, characterized by fever as high as 101.6° for a day or two, generalized aching of the bones, diarrhea and some nausea and vomiting in the early stages. She recovered from the acute stage of the illness within a week, but was never entirely well afterwards, the outstanding and persistent symptoms being rather rapid loss of weight, increasing weakness and a certain amount of what she described as gas and rumbling in her abdomen. There had also been a fairly definite loss of appetite, although this was not an outstanding feature. She had no pain anywhere other than that produced by what she chose to call gas.

On physical examination at admission the positive findings were as follows. Obesity, despite evidence of considerable weight loss. A dry yellow skin with pallor of the mucous membranes, suggesting definitely some type of anemia. She talked and acted to a certain extent like a person with a low thyroid function. The tonsils were bilaterally enlarged but not inflamed. The heart appeared normal. There was a faint systolic murmur at the apex and the base. The blood pressure was 180/100. No definite enlargement to percussion was made out, but the excess weight prevented accurate measurements. The lungs showed a few râles at the right base. The abdomen was difficult to examine. Nothing definite was made out except moderate tenderness in the epigastrium and slight voluntary spasm. No mass was felt. There was a scar of an operation wound about 9 centimeters in length over the sixth rib on the right.

The urine showed bacteria but was otherwise negative. The red cell count on admission was 3,300,000, the white count 9,300, the hemoglobin 55 to 60 per cent. Stained blood films showed a considerable degree of achromia with moderate variation in size and shape. The platelets were not decreased. The picture was not that of a primary anemia. Guaiac tests on her stools were positive. A catheter specimen of urine showed staphylococci on culture. A blood culture showed no growth in either flask. The basal metabolic rate was + 1.

She ran a low grade temperature, from 98° to 100°, usually in the afternoon about 99.6° to 99.8°.

X-ray reports were as follows. Gall bladder: Graham test negative. Spine and lungs: no evidence of metastatic malignancy. Colon: no

definite organic constriction or filling defect seen. No dilatation of the proximal colon. Sigmoid long and dilated. Stomach: no residue in stomach at six hours. Head of motor meal in transverse colon. As the barium stream entered the stomach there was slight cascading along the lesser curvature. No filling defects or constant irregularities were seen along the stomach, the pyloric valve or the first portion of the duodenum. Peristalsis was hyperactive. The stomach emptied rapidly. A large extraluminal pocket was present at the junction of the first and second portions of the duodenum. When the patient was upright there was a fluid level in this pocket. Conclusion: The slight variation from the normal on the lesser curvature just below the cardiac orifice of the stomach is not sufficient to make a positive diagnosis. It could be due to extrinsic pressure or to an anatomic variation. If an intrinsic gastric lesion is present it is too small to warrant a positive diagnosis. There is evidence of a diverticulum of the duodenum. The rapid emptying of the stomach may be due to achlorhydria. No explanation for the hyperperistalsis is available. A remote possibility is lead poisoning.

DR. GEORGE W. HOLMES: You can see the gall bladder shadow. It is in a rather unusual position, but otherwise normal.

The film taken of the chest shows prominent lung markings. The aorta is tortuous; some calcification. The heart is perhaps a little wide across the auricles. It is the ordinary picture of an old person's chest.

We have a series of films of the spine. The bones have a calcified look. There is considerably increased radiance, but nothing characteristic of metastatic malignancy. We have seen cases of metastatic malignancy in this type of picture, but the same picture can be produced by any calcification.

The pelvic bones are essentially negative. There is some calcification in the arteries of the pelvis. The bladder is distended with urine.

I do not see any reason to disagree with the report as read. There is nothing here to give me any additional evidence. The stomach appears to be rather smooth. One wonders why there is no peristalsis over this area of the lesser curvature. There is a peristaltic wave here on the greater curvature and there should be another corresponding wave on the lesser curvature. These waves are unusually high. This is the pocket which is spoken of as a diverticulum in the duodenum. The examination of the colon shows distention from the injection. A peristaltic wave emptied this part of the colon at the time the film was taken. Another colon film confirmed the previous findings.

DR. ADAMS: We were naturally anxious to perform a gastric analysis, but we could not because of the patient's objections. The x-ray had disturbed her considerably. She was so easily upset emotionally that it was impossible to pass a stomach tube.

Meanwhile the following report was received from her surgeon in New Jersey: "On June 22 I removed what appeared to be a cystic mass about 2.5 centimeters in diameter adjacent to but apparently not part of the right breast. The pathologic report at that time was malignant changes in a sebaceous cyst. I advised her of this and suggested to her the advisability of x-ray treatments. I also wrote a note containing this information. . . . Diagnosis: adenocarcinoma of breast.

"The specimen is a small cyst measuring 2.5 centimeters in diameter. Numerous pedunculated small masses extend into the cyst from the cyst capsule. Histology: extensive hyperplasia with orderly arrangement of the predominating cell is seen. This cell is of epithelium rather than squamous. Irreguar acini-like structures are present. The hyperplastic cell is rich in chromatin and gives the impression of rapid growth. Blood vessels are scanty. The condition is an adenocarcinoma."

That letter arrived shortly before the patient was discharged from the hospital.

The features which puzzled us were the extent of certain symptoms in the face of absence of other symptoms. There was a fairly marked anemia, yet the red count was only slightly decreased, a finding not particularly consistent with her bleeding from the gastro-intestinal tract. She had profound weakness, much greater than one could expect on the basis of the findings. Yet she had no gastric symptoms, and her appetite was fair. We did not know whether we were dealing with secondary malignancy which we could not find or with primary malignant disease of the stomach. If it were malignant disease of the stomach, it was difficult to understand why she had so few gastric symptoms and essentially negative x-rays in the face of what must have been a fairly extensive process. She was in no condition for an exploratory operation and such a procedure was never considered. On February 14, after three weeks in the hospital, she returned home, where she remained for practically another month.

She was seen once ten days after discharge from the hospital. At that time she felt about the same. She had had one fainting attack, probably associated with internal bleeding, as it occurred while she was at stool. There were certain significant changes in the physical examination. In the left supraclavicular region, at the lower pole of the thyroid, there was a small gland which had not been present previously. There was a mass in the epigastrium which definitely descended with respiration, was freely movable and had the feeling of a tumor. The red cell count was 3,100,000, the white count 16,000. The stained smear was the same as previously. The stools still showed a positive guaiac reaction.

We continued the same line of treatment, which had been forcing foods, vitamins and iron. Early on the morning of the first of March, having been in essentially the same condition, she was suddenly heard by the people with whom she was living to be gasping for breath. She was found to be in marked respiratory distress and complained of feeling smothered. She died quietly within ten minutes of the onset of this episode.

Clinical Discussion

Dr. Adams: At the time of admission, before we had blood smears and other studies, we considered the likelihood of primary anemia, hypothyroidism and cancer. The first and second were promptly excluded. The third possibility introduced the question whether there might be metastatic abdominal malignancy or generalized carcinomatosis secondary to the tumor which had been removed from the right chest wall. We promptly wrote to the hospital where she had previously been operated upon. The reply will be read later. Meanwhile the story of bleeding, loss of weight and secondary anemia made us most suspicious of carcinoma somewhere in the gastro-intestinal tract.

Our diagnosis at the time she left the hospital was anemia and probable cancer of the stomach. Our diagnosis at the time of death was carcinoma of the stomach with secondary anemia and probable pulmonary embolism. We considered coronary thrombosis as well, but in view of the fact that the tumor would give her a focus for an embolus, a pulmonary embolus from such a point seemed much more likely to be the immediate cause of death.

Clinical diagnoses (from hospital record)

Anemia.
Carcinoma of the stomach?

Dr. R. B. Greenough's and Dr. F. D. Adams' diagnoses

Carcinoma of the stomach.
Secondary anemia.
Pulmonic embolism.

Anatomic diagnoses

Adenocarcinoma of the stomach with metastases to the peritoneum, the greater omentum, the lesser omentum, the liver, the bronchial glands, the mesenteric and retroperitoneal glands, the pancreas, the gall bladder and the diaphragm.
Melena.
Thrombosis of the right internal iliac vein.
Pulmonary embolism.
Coronary sclerosis.
Diverticula of the duodenum.
Arteriosclerosis, marked aortic and coronary, moderate renal.
Atresis of the cervix of the uterus.
Pyometrium.

Pathologic discussion

Dr. Tracy B. Mallory: The autopsy showed a very typical carcinoma of the stomach, more or less saddle in type, running along the lesser curvature at the point where Dr. Holmes pointed out in the films the absence of peristalsis.

The immediate cause of death was, as has been guessed, a pulmonary embolus, which apparently arose from a thrombosis of the right iliac vein.

There were metastases present in various places, particularly on the pleural surface of the lungs.

An incidental finding was a completely atretic cervical canal and pyometrium. Whether that had any significance or not I do not know. It possibly had something to do with the spreading of the thrombosis into the iliac vein.

I think the most surprising feature is the site of this first manifestation in a single isolated metastatic lesion in the chest wall close to the breast. That is one of the last places one would expect a metastasis from a cancer of the stomach to appear.

Dr. Holmes: Was there anything in the lungs?

Dr. Mallory: We did not have a chance to examine them very carefully. The autopsy was done hurriedly outside the hospital.

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BUYING MEDICAL SERVICE ON THE INSTALMENT PLAN

IN the New Economic Era before the Doldrums which preceded the New Deal, the doctrine of instalment buying was a discovery of basic validity. It had been preceded, in its turn, by the doctrine of the soundness of instalment selling, under high pressure. Spend your money, preferably before you get it, was the cry. The patient fell sick and, now that the crisis seems to have passed, is likely to be restored to comparative health by careful nursing. Yet the doctors still do not agree as to the diagnosis.

To the elementary conceptions of use and payment and ownership should be added the time factor. Credit is deferred payment, a convenience become a necessity. Deferred use (or need) has little appeal to the imagination and deferred ownership has lost its charm. The aim of modern business is to spread cost so that it will be noticed least, by some method of instalment payment, giving immediate use even in the absence of immediate need. Perhaps it would be wiser not to spread the cost, so that realization may be more acute. Certainly indirect taxation permits many persons to think they pay no taxes. At any rate, since we prefer to gamble on health, and will not save against a rainy day, thus paying for sickness before it comes, but insist on trying to pay for it after it has incapacitated us, numerous schemes are being proposed so that persons and institutions rendering health service can maintain their independent existence, as against an alternative scheme of state medicine.

Insurance projects have been suggested. Reckoned on an annual basis, if there is no sickness for a given year, the benefits of the payments for that year are lost: one has paid, not for protection, because no protection to health is given but for imagined protection. Some purists in morality have declared this form of insurance to be indefensible: on the one hand, if one preserves one's health, one has paid for something one does not get, generally the case; on the other hand if one is sick, one may receive an amount of money quite out of proportion to what one has paid (this happens less often but the purist holds it to be just as immoral).

Other schemes more generally regarded as sound involve borrowing money at an alleged low rate of interest on little or no collateral (the character of the borrower is an important consideration) with instalment repayment. A pertinent objection to instalment buying is the exorbitant but often carefully disguised interest charge.

The question arises immediately: Why introduce a lending organization? Is not this a perfectly unnecessary additional expense, another middleman who has to be supported? The answer must be the test of experience: does it work? And it will work if people are willing to pay someone else to plan a part of their lives for them. It will not work if they are not willing. Just now the tendency is away from the old-fashioned virtues, and toward the concentration on making enough money to pay someone else to do most of our living for us. Perhaps organized assistance will have an educational value ultimately worth while for society.

The considerations which have been noted are a reflection of the urgency and importance of the problems which are demanding solution, and at the same time an indication of the lack of clear thinking in the community.

Among the schemes for instalment paying which have been or will be started, some will prove to be unsound. It behooves physician and patient and hospital and nurse and employer,

if all of these are involved, to scrutinize most carefully any proposed scheme before adopting it.

THE RESIGNATION OF DR. GEORGE H. BIGELOW

PUBLIC announcement of the resignation of Dr. George H. Bigelow, Commissioner of Health of Massachusetts, has appeared and His Excellency Governor Ely has nominated Dr. Henry D. Chadwick for consideration by the Council to fill the position thus made vacant.

Dr. Bigelow leaves his department well organized and the several divisions in cordial coöperation with each other. With few exceptions the medical profession has endorsed his policies, stood solidly behind his recommendations and has accorded to him the position of leader in public health work in Massachusetts during his administration. His interest in the welfare of his native state overshadowed any personal ambition and inspired a zeal and spirit of service which is phenomenal. He was ready at all times to appear on public platforms and at private conferences when his presence was desired, and was patient and considerate with those who seemed unable to comprehend the necessity of recognized health measures. The *Journal* extends to Dr. Bigelow its best wishes for success in his new environment.

The Commonwealth is to be congratulated in the selection of Dr. Chadwick. He is a worthy successor to Dr. Bigelow, for he made his greater reputation in this state as Superintendent of the Westfield State Sanatorium and Chief of Clinics of the Ten-Year Tuberculosis Study with which his name will always be associated.

Dr. Chadwick returns to this Commonwealth, after service with the Detroit Department of Health since 1929, with a mind well adapted to meet our health problems.

We predict a continuation of the best in public health administration under his direction.

THE COMPOSITION AND CLAIMS OF "VANNAY"

AMONG advertisements claiming good results in the treatment of overweight that of "Vannay" is alluring to the lay mind.

Like many robust advertisements this is claimed to be a discovery by "a great physician" who in this instance "has specialized in research with the Pasteur Institute of Paris". Of course "Vannay" is "harmless" and does not inconvenience the user and in addition the victim of adiposity need not adopt a starvation diet or practise unwelcome exercises. Simply "take the tablets each day" and "The fat disappears at just the places where you want to lose it."

The Bureau of Investigation of the American Medical Association reports that the exploiters of "Vannay" have given out the information that the product contains sodium taurolactate, secretine and lipase, but makes the discouraging statement that "We know of no scientific evidence that these ingredients have any place in the treatment of obesity."

The "great physician" is hereby discredited as has been so often done by the Bureau of Investigation. Unfortunately few outside of the medical profession know how to find good information respecting alleged remedies.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

WEISS, SOMA. A.B., M.D. Cornell University Medical College 1923. Associate Professor of Medicine, Harvard Medical School; Director of the Second and Fourth Medical Services (Harvard), Boston City Hospital. His subject is "Circulatory Disturbances of the Extremities: Medical Aspects." Page 267. Address: Thorndike Memorial Laboratory, Boston City Hospital, Boston.

MALLORY, TRACY B. M.D. Harvard University Medical School 1921. Instructor, Harvard Medical School. Pathologist, Massachusetts General Hospital. His subject is "Circulatory Disturbances of the Extremities: Pathological Aspects." Page 273. Address: Massachusetts General Hospital, Boston.

ALLEN, ARTHUR W. A.B., M.D. Johns Hopkins University Medical School 1913. F.A.C.S. Instructor in Surgery, Harvard Medical School. Associate Surgeon, Massachusetts General Hospital. His subject is "Circulatory Disturbances of the Extremities: Surgical Aspects." Page 274. Address: 264 Beacon Street, Boston.

FEEMSTER, ROY F. A.B., M.D. Johns Hopkins University School of Medicine 1924. D.P.H. July-November, 1931, Epidemiologist. November, 1931, to present—Assistant Director, Division of Communicable Diseases, Massachusetts Department of Public Health, Boston. Address: 546 State House, Boston. Associated with him is

KINGSTON, JAMES M. D.V.M. School of Veterinary Medicine, University of Pennsylvania 1912. 1913 to present—Veterinary Inspector, Massachusetts Department of Public Health. Address: 540 State House, Boston. Their subject is "A Scarlet Fever Outbreak Due to Raw Milk." Page 275.

HAMILTON, ALICE. M.A., M.D. University of Michigan Medical School 1893. Professor of Pathology, Northwestern Medical School for

Women, Chicago, 1896-1900. Special Investigator, U. S. Bureau of Labor Statistics, Washington, 1910-1921. Assistant Professor of Industrial Medicine, Harvard School of Public Health 1919-. Member of the Health Organization of the League of Nations, Geneva, 1924-1930. Her subject is "Industrial Poisons." Page 279. Address: 229 Beacon Street, Boston.

KING, DONALD S. A.B., M.D. Harvard University Medical School 1918. F.A.C.P. Assistant Physician, Massachusetts General Hospital in charge of Pulmonary Clinic. Assistant in Medicine, Harvard Medical School. Physician, Channing Home. His subject is "Benign and Malignant Tumors of the Lung, Bronchi, and Mediastinum." Page 282. Address: 205 Beacon Street, Boston.

PEIRSON, EDWARD L. JR. M.D. Harvard University Medical School 1925. F.A.C.S. Assistant in Urology, Massachusetts General Hospital; Assistant Urologist, Salem Hospital, Urologist, Lynn Hospital. His subject is "Malignant Tumors of the Testicle. The Value of X-ray Treatment." Page 291. Address: 33 Summer Street, Salem, Mass.

ROCKWOOD, ETHEL M. B.S. Johns Hopkins University School of Medicine 1914. Assistant in Dermatology, Massachusetts General Hospital. Her subject is "The Use of Sodium Perborate in the Treatment of Chronic Paronychia Due to Yeast Infection." Page 295. Address: 416 Mariboro Street, Boston.

WHEAT, HARRY R. M.D. Tufts College Medical School 1913. F.A.C.S. Orthopaedic Surgeon, Springfield Hospital, Mary Lane Hospital, Ware, Mass., Cooley Dickinson Hospital, Northampton, Mass., and Franklin County Hospital, Greenfield, Mass. Chief of Fracture Service, Springfield Hospital. His subject is "Tonsil Snare For Excision of Semilunar Cartilage." Page 296. Address: 20 Maple Street, Springfield, Mass.

MISCELLANY

GERMANY WILL STERILIZE THE UNFIT

According to a statement in the *New York Times*, a decree was issued July 26 to sterilize the congenital feeble-minded, those with hereditary insanity, epilepsy, St. Vitus' dance, blindness, deafness, serious bodily deformity and chronic alcoholism.

"Decisions on sterilization will be made by hereditary hygiene courts attached to each district court" on evidence of physicians in charge of such cases supported by opinions of specialists.

Sterilization may be ordered on petition of guardians, physicians or directors of institutions. There is a provision for an appeal to the appellate court for hereditary hygiene.

There is another law which provides for compulsory sterilization of perpetrators of sex crimes.

NOTE ON AN EARLY RECOMMENDATION RELATIVE TO CONTRACEPTION IN AMERICA

BY JOSEPH J. SPENGLER‡

As Professor Norman E. Himes* has recently observed, Bradford's reference to onanism is probably the first written reference by an American to a means to limit family size. Perhaps the most unique advice, relative to the control of births, ever offered by an American was that given in 1807 by Thomas Ewell, M.D. Ewell, a surgeon in the United States Navy, based his indications, relative to contraception, upon personal observation and upon the experiments which had been performed to isolate oxygen. For, as he writes†, he was convinced by theory and experiment that "the presence of pure, vital, or oxygen gas, is necessary to give the first animation to the embryo formed in the uterus, that it is only after the union with a little oxygen, that the embryo is enabled to receive more oxygen and nutrition from the mother; and that consequently coition will always be unfruitful unless it be done in pure air, so that some oxygen gas may be protruded before the penis into the uterus; for which purpose the termination of the penis seems properly adapted.

"The chances of successful copulation must naturally be greatest in the first of the night, as the air of beds before morning is well known to become so foul as to extinguish tapers when introduced. The astonishing number of births to the south, among the Negroes, appears to depend upon their copulating in the day, exposed to the sun, on the sides of hills, where the air is uncommonly pure. Their superintendents or overseers generally cohabit with the Negro women under similar circumstances, and with such success, that but few women of the farms fail having white children by them.

"If the above doctrine be correct, there is no doubt but that one of the causes of the barrenness of some married people may be, their not taking proper pains to guard against the presence of impure airs. Possibly the fruitfulness of some may be increased by a connection in a tub of oxygen gas. If there be a situation in which having children would be distressing in the extreme, a remedy or corrective for fruitful nature might be found by embracing only in vessels filled with carbonic acid or azotic gas."

Ewell's remarks are interesting for other reasons than the uniqueness of the proposal. His

*Note on the early history of contraception in America. New Eng. J. Med. 205:438 (Aug. 27) 1931.

†Generation. Medical Repository. 4 (Hexade 2):130, 1807.

‡Duke University, Durham, N. C.

reasoning illustrates the tendency of late eighteenth century thinkers to generalize extensively from a given principle, in this instance, the necessity of oxygen to life. Ewell's reference to "a situation in which having children would be distressing in the extreme" indicates that, at the time he wrote, some consideration was being given to the pros and cons of having children. Unfortunately, he does not state whether children "would be distressing" for economic reasons or reasons of health.

A RADIO MESSAGE PREPARED AND SPONSORED BY THE COMMITTEE ON PUBLIC EDUCATION OF THE MASSACHUSETTS MEDICAL SOCIETY FOR THE DEPARTMENT OF PUBLIC HEALTH

The Care of the Skin*

BY WILLIAM J. MC DONALD, M.D.

I wish to bring to your notice some of the unfortunate results of taking medicines without skilled advice. By medicine I mean pills, tonics, creams, lotions and allied preparations.

Recently a gentleman walked into my office with a strange and very disfiguring skin disease of the face. It had been diagnosed as tuberculosis, and indeed it did resemble that disease. To his amazement I called it a drug rash. Mind you, he was not by any means a devotee to morphine or cocaine. But, he was inveterately attached to a well-known so-called nerve tonic sold at all soda fountains and drug stores. This particular medicine is fraught with dire danger. It contains potassium bromide and acetanilide which can be harmful always in large and continuous doses, and often injurious even in small doses. Despite this fact, anyone can approach a soda fountain and obtain this drug without question. This man died shortly afterwards. Undoubtedly, he had slowly and unwittingly killed himself. Alcoholics, sufferers from headaches and nervous individuals would be well warned to steer clear of effervescing (so-called) nerve tonics.

Indulgence in any medicine whatsoever is to be deplored, unless it is authorized by a physician. Literally, hundreds of thousands of people are the victims of unnecessary self-medication. Why intelligent individuals will really believe the specious advertisements contained, not only in printed matter, but also in charlatanistic radio talks, is a matter of amazement. Would you ask a plumber to fit you out with an Easter frock? Well, it is just as silly to let a layman prescribe for your ailments. We, in this fair country, are inclined to become faddists. If a nerve tonic, a purgative pill, a skin lotion or some other medicine comes wrapped in an attractive manner, we accept it with open arms. If, to gull us still further, the names of foreign doctors are quoted as extra inducements, we are inclined to forget that the ethics of medicine forbid such charlatanism. Have you ever heard the names of British or American physicians in this connection? No—you certainly have not, unless under strictly correct circumstances. And, let me tell you this, the Vienna Medical Faculty has officially reproved those members whose names have been quoted by a certain yeast company, and forbidden them to give testimonials in the future. Therefore, remember that it is folly to drug yourself without a proper medical diagnosis.

A short time ago a patient consulted me for a large cancer of the breast. You will be amazed when I tell you that she had been treating it with an ointment of her own choice. She died in agony one month later. The case was too far gone even for surgery. Quite recently another lady with an ulcerating breast cancer allowed herself to be guided by a neighbor's advice, and she too used an ointment. She was sent to a competent surgeon and, I hope, will recover. Remember this, ointments will not cure cancer. It is dastardly and criminal for anyone to sell them for this purpose.

Visit a drug store some day and take note of the countless so-called tonics, dyspeptic mixtures, bladder pills and so on. It is astounding that people will blithely go in, state their ailments across the counter to a druggist, and calmly take what to them may be virtual poison.

Most nerve tonics contain bromide or similar sedatives. A certain percentage of people will invariably acquire a skin disease if they take such medicine. I do not believe that any disease whatsoever is caused by "so-called" nerves. If you are ill, if you are nervous, if you have any ailment at all, secure an accurate medical diagnosis. But, do not indulge in the irrational habit of perpetually swallowing nerve tonics without proper advice.

How often do we hear of sore throats which quickly become diphtheritic? Occasionally, mark you well, the sore throat is syphilitic. Ignoring these facts, the public will fatuously indulge in gargles and sprays which are harmless, as a rule; but how do you know your throat affection is not a source of menace to yourself and others? In our hospitals, children die of diphtheria only when the parents are neglectful and use gargles when antitoxin is called for. One would really believe we lived in ancient times and that black magic and incantations were still in use. Every sore throat should be inspected expertly, and if necessary, a culture for diphtheria germs should be done. This will not hurt the child. Rather it may save his life. During the war, in our hospital, every soldier with a sore throat was carefully examined for diphtheria.

The Australian bush is vast and tropical, and there it was that I once came upon an aged man, isolated from neighbors, dying, or apparently dying, in the agonies of acute obstruction of the bowel. His wife, paralyzed with terror, and quite helpless,

*June 13, 1933, Station WBZ, 4:30 P.M.

did, however, unearth an enema syringe. By its use the obstruction was overcome and the man recovered. Why mention this incident? Because it dramatizes the folly of self-medication. This man, to relieve pain, took a violent purgative. He thereby precipitated an acute bowel obstruction. In the presence of abdominal pain, refrain from drastic purgatives. Acute appendicitis and other acute abdominal emergencies are positively made worse by such measures. Headache is a very common complaint. Likewise it is common to take aspirin and allied sedatives for its relief. It is not common sense to pamper a headache with possibly harmful drugs. There is always a cause for headache. Find out what it is and take the correct remedy.

At this point may I warn you of the indiscriminate use of ointments and lotions for the relief of skin disease, facial blemishes, superfluous hair, sweating and ulceration of any sort? In all conscience it is sometimes hard even for an expert skin specialist to remedy certain ailments. But self-medication for the above conditions is bound to lead you into trouble. For instance, many remedies widely advertised for the cure of "athlete's foot" are very irritating and aggravate the disease. This affection merits individual attention and, naturally, must be accurately diagnosed. The physician alone can recognize the disease. He alone can correctly treat it. It is a menace to the community. It is everywhere spreading with the rapidity of a forest fire. More precautions should be taken for its arrest. Most certainly it should receive expert attention.

I would most emphatically warn my lady listeners of the danger of certain depilatories. All are not harmful. Some are. One in particular, used by many women, is vicious, dangerous and leads to great suffering. It contains thallium acetate — a very deadly drug. Reports in medical journals emphasize the danger of depilatories containing thallium acetate. In Germany this drug is used as rat poison. I know of no safe way to remove hair permanently except by the electric needle.

Freckle removers and bleaching creams are harmful if used persistently. Most of them contain mercury. Some face powders contain mercury, lead and orris root. These are most atrociously harmful to certain people and cause distressing eruptions, and at times, brown staining of the skin. Some hair tonics will cause a violent inflammation of the scalp, neck and face. Perfumes, too, especially the cheaper variety, as well as certain toilet waters, will irritate the skin and cause unnecessary suffering. Mind you, the majority of the creams on the market are safe. The beauty parlors are not to be condemned by any means. But, beware of harmful toilet preparations. Your physician is aware of their danger and will advise you correctly.

Time and time again elderly people persist in applying creams and ointments given them by friends, to cure small growths that appear on the face. They fail to realize the cancerous nature of such maladies. I warn you most emphatically to leave them alone. They should be treated by a physician and by no one else. The layman or laywoman who dares to interfere with such malignant growth is deserving of great censure. Surgery and radium are eminently splendid remedies for their eradication.

I am persistently asked if I believe cold cream is necessary for a healthy skin. Well, I do not. Certain dry skins, I know well, will not tolerate soap or water. But, I emphatically state that soap and hot water are not only valuable for the skin, but downright necessary. How can a cold cream help your skin? It cannot. If you rubbed very hard you might force some of it in. Even if you did, its chemical composition differs entirely from human fat and oil. The average man has a much cleaner skin than a woman, and this is due to vigorous soap and water cleansing and shaving. It is a very common thing to hear people blame skin diseases upon "too much acid in the blood," "the liver," or "poor blood". Such utterly inane ideas emanate from pure unadulterated ignorance. Half the time the reason for a poor skin is entirely internal, and cannot be stupidly guessed at. Laziness, late rising and retiring, overeating, overindulgence in alcohol and overheated rooms are the causes of poor skins and facial blemishes. Our greatest difficulty is to make people realize this. It would seem that the art of walking is becoming lost. So too will complexions, unless the automobile is garaged and walking taken up as a national pastime. You simply cannot obtain a good healthy skin by cream alone. If your skin is bad, then there is something wrong with you, your food or your habits.

It would be just as well at this time and upon this occasion to advice people against overindulgence in tobacco. We do not in the least condemn smoking, but it might be well for everybody, and especially those of the fair sex, to curtail their smoking. Indulgence in tobacco, in moderation, I, personally, believe is harmless.

The guardians of public health in this and other countries are properly educated physicians. Do you good folks realize what would happen if this fight did not go on? You would die by the thousands, of plague. You might be riddled with tuberculosis. Typhoid fever might decimate your homes. Mothers at childbirth might perish with septicemia. Our markets would be flooded with death-dealing drugs and obnoxious skin preparations. As it is, they creep in even now. But the American Medical Association and its branches are guarding your interest. Without your knowledge these dangers are being met and resisted tooth and nail. This fight against charlatanism goes on all the time. I ask you to assist in the fight, by your hearty coöperation.

CORRESPONDENCE

CHART FOR USE IN THE DIAGNOSIS OF BRIGHT'S DISEASE

July 19, 1933.

Editor, *New England Journal of Medicine,*

I am enclosing charts, together with an explanation of the procedure, and signs to be used.

I have used these charts for the past two years in my teaching work at Tufts College Medical School and in my postgraduate Clinico-Pathological Conference with considerable success.

I find that the general practitioners are interested in working them out for themselves.

Very truly yours,
SIDNEY C. DALRYMPLE, M.D.

Newton Hospital,
Newton Lower Falls, Mass.

THE DIAGNOSIS OF BRIGHT'S DISEASE

SIDNEY C. DALRYMPLE, M.D.

The open chart on page 313 is submitted for the reader to fill in. The classification used is that of Volhard and Fahr modified by Fishberg in "Hypertension and Nephritis."

An illustration of the completed chart will appear in next week's issue.

The following letters and numbers will be used:

Age: 1—young. 2—middle. 3—old.

Edema:
- I—Inflammatory.
- N—Nephrotic.
- C—Cardiac.
- T—Toxic.

N—Normal.
P—Present.
A—Absent.
D—Decreased.
E—Elevated or increased.

The term "eye grounds" refers to hypertensive retinopathy or so-called albuminuric retinitis.

Serum Protein—Any reading above 5% is here considered normal.

Columns 3 and 7 are to be considered compensated stages. The decompensated stage of 3 and 7 will be tabulated in column 19.

See chart on page 313.

OBJECTION TO "SEMI-JUDICIAL BOARDS"

July 31, 1933.

Editor,

The *New England Journal of Medicine,*

I have read your Editorial "Expert Medical Opinion," as well as Frederic Jay Cotton's suggestion on the same subject of medical malpractice. It was precisely because I was afraid that the profession might be stampeded by Mr. Bushnell, that I anticipated both you and Dr. Cotton with the suggestion to the advocate that the plaintiff be required to file a bond in these cases.

Of course I did not expect him to respond.

It seems to me that before we set up in the profession any more judicial or semi-judicial boards, which are the source of annoyance to all concerned, it would be well to remember that the function of the medical profession is to practice medicine and not law.

Yours truly,
JOHN J. HURLEY, M.D.

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

535 North Dearborn Street, Chicago, Ill.,
August 2, 1933.

Managing Editor,

The *New England Journal of Medicine,*

In addition to the articles enumerated in our letter of June 30 the following have been accepted:

E. R. Squibb & Sons
Ipral Tablets, ¾ grain

The following product has been included in the List of Articles and Brands Accepted by the Council But Not Described in N.N.R. (New and Nonofficial Remedies, 1933, p. 437):

Merck & Co., Inc.
Carbon Tetrachloride—Merck

Yours very truly,
PAUL NICHOLAS LEECH, *Secretary,*
Council on Pharmacy and Chemistry.

RECENT DEATHS

STOCKWELL — HERBERT EMMONS STOCKWELL, M.D., aged 63, of 36 Andover Street, Pittsfield, died July 30, 1933, after practicing for thirty years in this city. He had retired from practice five years before his death because of illness. Dr. Stockwell was born in Des Moines, Iowa, the son of Dr. Chester Twitchell and Sophia Pierce Stockwell. He graduated in medicine from the University of Vermont College of Medicine. He joined the Massachusetts Medical Society in 1899.

Dr. Stockwell was interested in civic affairs having served on the local board of health and the school committee.

He is survived by his widow, two sons Herbert E. Stockwell, Jr., of Pittsfield and Louis Gordon Stockwell of Stockbridge, a daughter Mrs. Morrier and one sister Miss Mella Stockwell of Springfield, Massachusetts.

(Further Death Notices on page 314)

BRIGHT'S DISEASES

	NEPHRITIS (Glomerular) (Endocapillaritis)			NEPHROSIS (Tubular Degeneration)	ESSENTIAL HYPERTENSION (Arteriolosclerosis)			NEPHRITIS (Other than Glomerular)			NEPHROSIS (Other than Chronic)				Benign Albuminuria	Arterio-sclerosis	Prostatic obstruction Hydro-nephrosis	Chronic Passive Congestion	Renal Decom-pensation	Pre-Renal De-privation of Fluid Normal Kidneys
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Acute (hemor-rhagic)	Chronic nephrotic phase	Chronic secondary contracted	Chronic (lipoid) (Epstein's)	Benign	Malignant	Primary Contracted	Multiple Glomerular Embolization Subacute Bacterial Endocarditis	Focal Nephritis	Acute Inter-stitial	Larval febrile diabetic jaundice	Necro-tising	Amyloid	Preg-nancy						
Age																				
Edema																				
Blood Pressure																				
Eye Grounds																				
Cardiac Hypertrophy																				
Urine Volume																				
Sp. Gr. Concentration																				
Phenolsulphone-phthalein																				
Urine Albumin																				
Hematuria																				
Casts other than Hyaline																				
Double Refrac-tile Lipoids																				
Urea Clearance																				
N. P. N.																				
Serum Protein																				
Secondary Anemia																				

RECENT DEATHS

(Continued from Page 312)

LOUGEE — GEORGE WOODWORTH LOUGEE, M.D., of 57 Estes Street, Lynn, Massachusetts, died at his home, August 4, 1933. He was born at Effingham Falls, New Hampshire, in 1859 and graduated from Bowdoin Medical School in 1883. Before coming to Lynn, twenty-five years ago, he had practiced in Freedom and Ossipee, both towns in New Hampshire. He joined the Massachusetts Medical Society in 1912. He is survived by his widow Mrs. Florence Lougee, a son Hayes Lougee, a daughter Mrs. Louise M. Baird and a sister Miss Abbie S. Lougee, all of Lynn. He was a brother of the late Dr. Frank T. Lougee.

DENNING—EDWARD JOHN DENNING, M.D., of 317 Clark Road, Brookline, Massachusetts, and with an office at 45 Bay State Road, Boston, died August 2, 1933, at his summer home in Cohasset.

Dr. Denning was born in South Boston in 1879 and was educated in the Boston Latin School and Harvard University and graduated in medicine from the Harvard University Medical School in 1905. He was Associate Professor of the Theory and Practice of Medicine in the Tufts College Medical School, a member of the Massachusetts Medical Society, having joined in 1906, the American Medical Association and Medical Chief of the Carney Hospital.

He is survived by his widow Mrs. Frances A. (Martin) Denning and two daughters.

WOODILL—GEORGE FRANKLIN WOODILL, M.D., of 16 Atlantic Avenue, Lynn, Massachusetts, died August 1, 1933. He was born in Natick, Massachusetts, in 1867 and graduated in medicine from the College of Physicians and Surgeons of Boston in 1890. He served for many years as physician for the Lynn Home for Aged Women. He is survived by his widow Mrs. Edith F. Woodill, a daughter, Mrs. Dorothy W. Marr of Marblehead, and two sisters, Dr. Edith Woodill of Waverley and Mrs. Bessie S. Sawyer of Belmont.

HUBBARD—WALLACE E. HUBBARD, M.D., of 1109 Boylston Street, Boston, died August 1, 1933.

He was born in Amherst, Mass., in 1880 and after his family moved to Somerville he acquired his early education in the schools of that city and in Harvard University. He graduated in medicine from Harvard University in 1904 and practiced for a few years in Massachusetts. He entered the Government Service at the Gorgas Hospital in Ancon, Canal Zone, serving as assistant chief surgeon until 1922 and after that until 1928 as chief surgeon at the Gorgas Hospital in Tampico. He then retired.

Dr. Hubbard was a Fellow of the American Medical Association, the Medical Association of the Isthmian Canal Zone and several fraternal organizations.

He is survived by his widow, Mrs. Florence H. Hubbard of Boston, and four brothers, Dwight L. of Boston, Harry F. of Detroit, Fred and Edward O. of Peterboro, New Hampshire.

LINDSEY—JOHN HATHAWAY LINDSEY, M.D., of 881 Madison Street, Fall River, with an office at 151 Rock Street, died July 29, 1933. At the time of his death Dr. Lindsey was President of the Bristol South District Medical Society.

He was born in Fall River in 1870, the son of William and Adrienne (Lovell) Lindsey. His premedical education was acquired in the public schools of his native city and in Brown University from which he obtained his A.B. degree in 1892. He graduated in medicine from the University of Pennsylvania School of Medicine in 1899 and afterward studied in Berlin for two years. He began practice in Washington D. C., and twenty years ago moved to Fall River. During the World War he served in this country and in France retiring with the rank of Captain. He joined the Massachusetts Medical Society in 1904 and again in 1914 and was also a Fellow of the American Medical Association. He was president of the Fall River Anti-Tuberculosis Association and was a member of the New England Roentgen Ray Society.

He is survived by his widow and four sons, David, Crawford, Richard and John Lindsey.

REPORTS OF MEETINGS

PLANS FOR TUBERCULOSIS CLINICS IN NORFOLK COUNTY

At the invitation of the Trustees of the Norfolk County Hospital a group of approximately one hundred, composed of selectmen, members of boards of health of the hospital district, and invited guests, met on the grounds of the Summer Health Camp at the Hospital on Tuesday, August 1. The affair was a combination social and business gathering.

The business was to discuss the setting up of additional tuberculosis clinics in several towns of Norfolk County not now having clinic service. Hon. Frederick A. Leavitt, Chairman of the County Commissioners, presided at the meeting. Dr. George H. Bigelow, State Commissioner of Public Health, was the speaker of the day. He outlined the advantages of early diagnosis and treatment of tuberculosis, stressing the fact that such diagnosis can best be secured through expert medical service augmented by the use of x-ray. He explained the legal aspects of the undertaking and urged the selectmen and members of the boards of health seriously to consider availing themselves of the opportunity for clinic service offered by the Norfolk County Hospital under recently passed legislation.

Dr. Nahum R. Pillsbury, Superintendent of the Norfolk County Hospital, explained the Hospital Service, the Clinic Service and some of the modern methods of handling tuberculosis patients in the Norfolk County Sanatorium.

Members of the boards of health, selectmen and some of the guests participated in the discussion.

A referendum by show of hands was held and representatives of most of the towns indicated their interest in discussing Clinic Service for their localities.

Following the business session, those in attendance were guests of the hospital at supper in the grove adjoining the camp. Following this, visits were made to the camp where exhibits of the work done in the manual training classes were on display. The day's proceedings were brought to a happy conclusion by all attending the salute to the flag and end-of-the-day exercises carried out by the councillors and the one hundred children who are having eight weeks' preventorium treatment at the Norfolk County Summer Health Camp.

NEW ENGLAND HEART ASSOCIATION

Secretary's Report
May 26, 1933

During the past two years the New England Heart Association has continued its program of giving a series of lectures at the Boston Medical Library to members of the medical profession and others interested. Twenty-four lectures in eight meetings were given during the year 1931-32 and fourteen lectures in seven meetings during the year 1932-33; four lectures comprised a special lectureship which was given by Dr. Ronald T. Grant of London. A Survey of the Resources for Children with Heart Disease in the Clinics and Hospitals of Boston was made by a Committee of the Board of Governors, Miss Mabel R. Wilson, Chairman, the results of which were reported January 11, 1933, by Miss Wilson at the special meeting on "The Social Problem of the Child with Heart Disease." Four other papers were also presented at this meeting.

All of these lectures up to and including the meeting of January 11, 1933, have been published in the *New England Journal of Medicine*, and reprints for the years 1930-31 and 1931-32 have been sent to all members and to various Medical Libraries and Heart Associations throughout the country; a total of 1,650 pamphlets in all.

Two hundred and fifty programs were sent out, preceding each meeting, to members of the Association and various hospitals, making a total of 3,000 notices in all. Fifty posters announcing Dr. Grant's lectures were sent to hospitals.

Beginning with January, 1932, 350 copies of "Modern Concepts of Cardiovascular Disease," published by the American Heart Association, have been mailed each month to members of the Association and to a selected list of doctors in New England, making a total of 5,600 sent out up to May 1, 1933.

Nine hundred Cardiac Clinic Record forms, compiled by a Committee under the Chairmanship of Dr. James M. Faulkner, have been distributed since January, 1932, to the Cardiac Clinics at the various hospitals, in the city, for trial.

In February, 1932, at the request of the Heart Committee of the Cambridge Tuberculosis and Health Association, a group of twelve doctors examined 339 students in the Cambridge High and Latin Schools who were reported by the school physicians as having heart disease.

In February, 1932, the Association compiled "A List of Organized Groups for the Care of Heart Disease in New England," and distributed 900 pamphlets to the 25 Heart Clinics listed therein, and to members of the Association.

Since December, 1932, the Secretary has been serving as a member of the Heart Committee of the Cambridge Tuberculosis and Health Association, to give advice in planning the activities of the Committee. Through this Committee the New England Heart Association has provided 17 doctors as speakers to the Parent-Teachers' Associations, at 25 different schools in Cambridge, on the subject of rheumatic heart disease. In this way, approximately 10,000 people have been reached.

Fifty-four letters, forwarded by the American Heart Association from various people in New England concerning problems of heart disease, have been answered by the Association.

There are at present 148 members.

A contribution of $50.00 toward the work of the American Heart Association has been made each year.

A contribution of $50.00 was sent to the Boston Medical Library as a token of our appreciation of their kindness in allowing us the use of John Ware Hall for the last three years free of charge.

Respectfully submitted,

Paul W. Emerson, M.D., *Secretary.*

SOUTHEASTERN ASSOCIATION OF BOARDS OF HEALTH

The Southeastern Association of Boards of Health, at the annual and guest meeting, brought together about one hundred persons on July 26, at Mattapoisett. The election resulted in the following list of officers to serve during the coming year: President, Charles R. Bassett of Yarmouth; Vice-Presidents, Dr. T. L. Swift of Falmouth and C. E. T. Ward of Orleans; Secretary-Treasurer, George F. Crocker of Marstons Mills. Executive Committee, Dr. R. P. MacKnight of New Bedford, F. W. Delano of Fairhaven and Dr. W. O. Hewitt of Attleboro.

At the afternoon session, Dr. Richard P. MacKnight, State District Health Officer, was the principal speaker, his subject being, "Duties and Obli-

gations of Local Boards of Health." The speaker referred to the changes of the past fifteen or twenty years, which have made great differences in the duties of the officers. Education of the public and control of communicable diseases are now the prominent features of the work. It is of fundamental importance to control the milk and water supplies. In the former, the speaker called attention to the fact that while about 85 per cent of the supply is pasteurized, it does not mean that this ratio of the population is protected, for there are quite a number of the smaller communities not protected.

The important work here, as well as in prevention of communicable disease, lies in the education of the people. Remarkable progress in the control of some of the diseases has been made in Massachusetts and other states. Smallpox, once so dreadful a scourge and the cause of the establishment of a number of early boards of health, is now so rare here, that the medical student has practically no opportunity to observe it. The Chadwick Clinics are a valuable means of keeping track of and lessening the ravages of tuberculosis and other maladies, and in this work the State desires the coöperation of official health bodies.

Dr. MacKnight emphasized the need of early notification and of close relationships between the boards and the local physicians. In this matter there are some concessions to be made by both groups, but a clear understanding is essential. It is the duty of the health officer to visit the home, get the facts and, to as great an extent as possible, look up the contacts, and where means exist, have them immunized. It is important to keep accurate records, and to use them for the basis of the follow-up.

Incidentally the speaker suggested the undesirability of having the selectmen serve as members of the boards of health. He referred to the readiness of the State Department of Public Health to give aid especially to smaller communities, and emphasized the importance of forming health units among neighboring districts.

Discussion of general topics followed, some of which were whether the incidental noise of racing outboard boats, even though muffled, constitutes a health risk; the most efficient means of disposing of garbage and refuse; the economical collection of garbage from boats moored in the harbor; and the best way to handle the black fish problem, which constitutes an occasional serious nuisance.

The local committee included Dr. I. N. Tilden and Mr. Lemuel LeBaron of the Mattapoisett board.

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

August 13-27—The Fifth International Medical Post-Graduate Courses of the Tomarkin Foundation will be held in St. Moritz, Switzerland. The subjects in these courses are Allergic Diseases, Diseases of the Blood, Climatology, Rheumatism and Arthritis and Diseases of Metabolism. Address Chr. Jilli, St. Moritz.

September 11-15—The Twelfth Annual Scientific and Clinical Session of the American Congress of Physical Therapy will be held at the Palmer House, Chicago. Address the Executive Secretary, 30 North Michigan Avenue, Chicago.

September 16—The American Board of Otolaryngology will hold an examination in Boston just prior to the meeting of the American Academy of Ophthalmology and Otolaryngology. Prospective applicants for certificate should address the Secretary, Dr. W. P. Wherry, 1500 Medical Arts Building, Omaha, Nebraska.

September 19, 20, 21—The Connecticut Clinical Congress will meet at New Haven. Subjects for consideration: Diseases of the Blood, Diet in Disease, Industrial Injuries and Neuroses. Lectures, Demonstrations, Group Conferences.

September 25-30—The American Congress of Radiology will be held at the Palmer House, Chicago. For particulars write to Dr. Benjamin H. Orndoff, 2561 North Clark Street, Chicago.

September 29 and 30—New England Surgical Society at Boston.

October 9-12—The American Public Health Association will hold its sixty-second annual meeting at Indianapolis. For details on the scientific program write to the American Public Health Association, 450 Seventh Avenue, New York, N. Y.

October 9-13—The Clinical Congress of the American College of Surgeons will hold its twenty-third annual session at Chicago. Headquarters for the Congress will be at the Stevens Hotel.

October 16, 17, 18—Massachusetts State Nurses' Association, Hotel Kimball, Springfield, Mass. For details write Helene G. Lee, R.N., 420 Boylston Street, Boston.

October 23 - November 3—The 1933 Graduate Fortnight of the New York Academy of Medicine. The theme during the two weeks of intensive study will be Metabolic Disorders. A complete program may be obtained by writing Dr. Frederick P. Reynolds, The New York Academy of Medicine, 2 East 103rd Street, New York City.

October 25-30—International Congress on the Scientific and Social Contest Against Cancer will be held at Madrid. For information address Dr. Julio Bejarano, Atocha, 104. Madrid, Spain.

October 28—The American Board of Dermatology and Syphilology will hold written examinations for candidates in the following cities: New York City; St. Louis, Mo.; Boston, Mass.; Cleveland, Ohio; San Francisco, Calif.; Philadelphia, Pa.; Chicago, Ill. Information may be obtained from the Secretary, Dr. C. Guy Lane, 416 Mariborough Street, Boston, Mass.

December 15 and 16—The American Board of Dermatology and Syphilology will hold oral examinations in New York City. Information may be obtained from the Secretary, Dr. C. Guy Lane, 416 Mariborough Street, Boston, Mass.

April 16-20, 1934—The American College of Physicians will hold its Eighteenth Annual Clinical Session in Chicago at the Palmer House. For information write Mr. E. R. Loveland, Executive Secretary, 133-135 South 36th Street, Philadelphia, Pa.

July 24-31, 1934—The IVth International Congress of Radiology will be held in Zurich under the presidency of Professor H. R. Schnis. General Secretary Dr. H. E. Walther, Gloriastrasse 14, Zurich.

BOOK REVIEWS

The Vitamins in Health and Disease. By BARNETT SURE, Ph.D. Williams & Wilkins Co., Baltimore, 1933. Price $2.00.

The discovery of the vitamines, their rôle in health and human diseases especially, and the foods that contain them are simply and concisely described in the book. On this account the author has attained his purpose, inasmuch as the way he describes the vitamins is interesting and at the same time may be readily understood by college students, nurses, dietitians, and practitioners. References to technical articles are omitted, but quotations from and references to general papers are given. The book contains a good index of authors and subjects, is well printed, but is not illustrated.

Obstetrics and Gynecology. Edited by Arthur Hale Curtis. With 1664 illustrations. Volume I. W. B. Saunders Co. 1933.

This book is the first of three volumes covering the obstetrical and gynecological field. It is edited by Dr. Arthur H. Curtis, Professor of Obstetrics and Gynecology in the Northwestern University Medical School. Dr. Curtis states, "It is planned to publish a new edition every five to eight years, the work of former authors being reëdited by them or their names retained and their contributions altered and rejuvenated by those most worthy to follow in their footsteps. A new editor is to be chosen from time to time to carry on the work."

The book is an outstanding contribution and Dr. Curtis is to be congratulated on the excellent coördination of the various subjects. In the first volume twenty-six writers contribute articles. In any such large group certain chapters must naturally stand out and are to be especially commended. The historical review is fascinating reading, and reveals a tremendous amount of research on the part of the author, Dr. Cutter, Dean of Northwestern University Medical School.

Section I deals with the anatomy of the female genital tract, and the excellent dissections of the female pelvis are unusually well reproduced.

Section II is on the physiology of the reproductive organs. It is written by Dr. Novak with two chapters by Dr. Hartman, both of Johns Hopkins University. In no textbook before has this subject been discussed so clearly and succinctly. The brilliant work of these two authors is now made readily available to physicians and students. These chapters are among the best if not the best in the book.

Section III is on morphology and physiology of pregnancy, and the various chapters are well done, but in some of them the writers are verbose. Plate I, illustrating Chadwick's sign, is almost grotesque in its coloring. It is difficult to see why, in the management of normal pregnancy, pyelitis of pregnancy should be included.

Section IV is on the physiology of birth processes, and Section V covers labor. In Dr. Baer's chapter on the "Conduct of Normal Labor" it is interesting to read that he recommends delivery in the lateral position, a position that has been used but little in the last ten years. The reviewer cannot agree that Dr. Baer's technique of surrounding the upper leg is reasonable or advisable. Dr. Baer's outline is based on procedures used in a hospital, and there is practically nothing written in regard to home deliveries. Whether or not he approves of the newer analgesics that are being used, he should have included a discussion of them in his chapter.

Section VI contains a chapter on "The Newborn Child" and one on "Changes in Fetal Circulation Following Birth."

Section VII is headed "Pathology of Pregnancy." The first chapter is a running comment on many illnesses complicating pregnancy, some of which are quite superficial and could well be omitted. The chapter on "Toxemias of Pregnancy" by Drs. Mussey and Randall is well done, the treatment in the various conditions is very clearly given, and the reviewer notes with interest the clear distinction that the writers make between a chronic nephritic condition and the toxemias of pregnancy. The final chapters are on disturbances due to diseases and abnormalities of the female genitalia and spontaneous abortion and premature labor.

The book ends with an adequate index. At the end of each of the chapters is a well-chosen bibliography. The illustrations are excellent, in some of the chapters many are original, others are well chosen, and all are well reproduced.

If this first volume is any criterion of the two which are to follow, the work will be a real contribution to obstetrical and gynecological literature.

Chronic Arthritis and Fibrositis. Diagnosis and Treatment. By Bernard Langdon Wyatt, M.D. William Wood & Co. 1933. Pp. 180. Price $3.50.

This book represents accepted views of Arthritis and Fibrositis of today. It is a supplementary addition to the author's earlier book, "Chronic Arthritis and Rheumatoid Affections." It also purports to be a technical treatise. However this may be debated on the grounds of technical presentation of hypotheses and views of one aspect of the Chronic Disease Problem.

If a man in general practice expects to find a ready-made list of diagnoses and indicated treatments nicely indexed and at hand there will be disappointment. The book contains a wealth of information and, if one reads each page, one will be repaid amply.

Pathological Fibrositis is emphasized and the importance of physical therapy (particularly massage) is stressed. Strychnine and iron preparations are dealt with thoroughly.

The obvious defect present in most treatises of arthritis is impressed on one again, namely, that there is not a long enough period of observation of arthritics to determine the natural and treated course of the disease before results and opinions are published.

Dietetics for the Clinician. By Milton A. Bridges. B.S., M.D. Lea & Febiger, Philadelphia, 1933. Price $6.50.

The book is divided into three parts. In the first the mechanical and chemical factors in digestion and the vitamin and other contents of food are described. The second is entitled "Diseases and their Diets"; and the third is devoted to infant feeding, the maintenance of health in children, and dietary practices used in pediatrics. In the appendix, many useful recipes for invalids and various tables are

given. Some of the sections, and also the appendix, have been written by authors specializing in the different subjects. The book contains a special feature that makes it particularly valuable, inasmuch as the food to consume for most diseases is written out in several sample menus. While the work is especially compiled for practitioners, it is also a good source of information for medical students and dietitians.

The Physiological Effects of Radiant Energy. By HENRY LAURENS, Ph.D. American Chemical Society Monograph Series. Published by The Chemical Catalog Company, Inc., New York. Price $6.00.

This book is a compilation of some of the best written contributions to the subject. It is of particular value to students and to physicians who wish information concerning the history of the development of radiology and its significance in therapy.

It is structurally well organized and an impressive expcsition of the subject from the standpoint of authoritative review. The chapter which outlines the physics of radiant energy is quite complete, and many interesting data will be found in the section describing the physiological effects of radiation therapy upon metabolism.

The publishers have done a real service by introducing this work to the medical profession.

Papers Relating to the Pituitary Body, Hypothalamus and Parasympathetic Nervous System. By HARVEY CUSHING. Published by Charles C. Thomas. Price $5.00.

This volume contains four lectures on the pituitary body and related subjects. The material is delightfully presented and covers most of the recent advances in this all-important master gland. The work of the last few years has brought tremendous advances in the endocrine field as a whole, and has made it more and more apparent that almost all endocrine glands are controlled by the pituitary. Therefore, if one is to be abreast of the times, one must have a working knowledge of this gland, and these four lectures, especially the first three, should be read by all. The syndrome produced by basophilic adenomas of the pituitary, often called Cushing's Disease, is presented in Lecture 3.

Medicine in Canada. By WILLIAM BOYMAN HOWELL. Clio Medica Series, edited by E. B. Krumbhaar, M.D., Vol. IX. Paul B. Hoeber, New York, 1933. xiii + 137 pages. Price $1.50.

This small book conforms to the standard set by previous issues in this series. The history of medicine as it has developed in various parts of Canada is depicted in an interesting and authentic manner. Chapters of special interest are those on early French-Canadian medicine, the development of the hospitals, particularly the Montreal General and the Toronto General, and biographical notices of physicians who have made distinct contributions to local medicine in the districts where they have practiced. This short survey fits in well with the longer history of medicine in Canada by Heagerty and the shorter works by Birkett and Abbott.

A Synopsis of Surgical Anatomy. By ALEXANDER LEE MCGREGOR, M.Ch. (Edin.,) F.R.C.S. (Eng.). New York: William Wood and Company. 1932.

This volume, the first didactic publication from the Anatomy Department of the University of the Witwatersrand, Transvaal, aims to present anatomic facts of practical value to the senior student and practitioner. It consists of a series of separate, discrete essays, systematically arranged, but making no attempt to deal with the complete anatomy of the body. It is somewhat sparsely illustrated with 606 excellent figures, and contains a vast amount of information rather loosely correlated, but in very compact, compendious form. Sir Harold J. Stiles, in his foreword, praises justly the original manner in which the author has presented and illustrated his subjects; and Dr. Raymond A. Dart in the introduction comments on its novel methods of presentation. The book should be of especial value to English students in preparation for examinations, rather than as a systematic textbook.

Surgical Anatomy. By C. LATIMER CALLANDER, A.B., M.D., F.A.C.S. Philadelphia and London: W. B. Saunders Co. 1933. Price $12.50.

Of many treatises on applied and surgical anatomy which have appeared since the days of Deaver's monumental monograph, this new textbook from the University of California Medical School at San Francisco is one of the most attractive and in many respects most satisfying. Dr. Dean Lewis in a foreword calls attention to the recent eclipse of gross anatomy and its direct application to medicine and surgery. This book, begun by the author in collaboration with his father, the late Dr. Cyrus Newton Callander, aims to present anatomic facts in terms of this clinical importance. On the one hand it avoids the diffuseness and faulty perspective of purely descriptive systematic anatomy; on the other hand, without diverging too far into the fields of operative surgery and surgical technic, it describes the common operations and surgical routes of approach. It is illustrated by 1280 figures of great merit, some in colors, many from original drawings of dissected material. The well-written and readable text traverses the ground concisely and logically, without important omissions. This work should fill a definite place, not only in the hands of teachers of applied anatomy but also in those of students and practitioners of modern surgery.